

MOTOR AGE

Vol. XXVIII
No. 12

CHICAGO, SEPTEMBER 16, 1915

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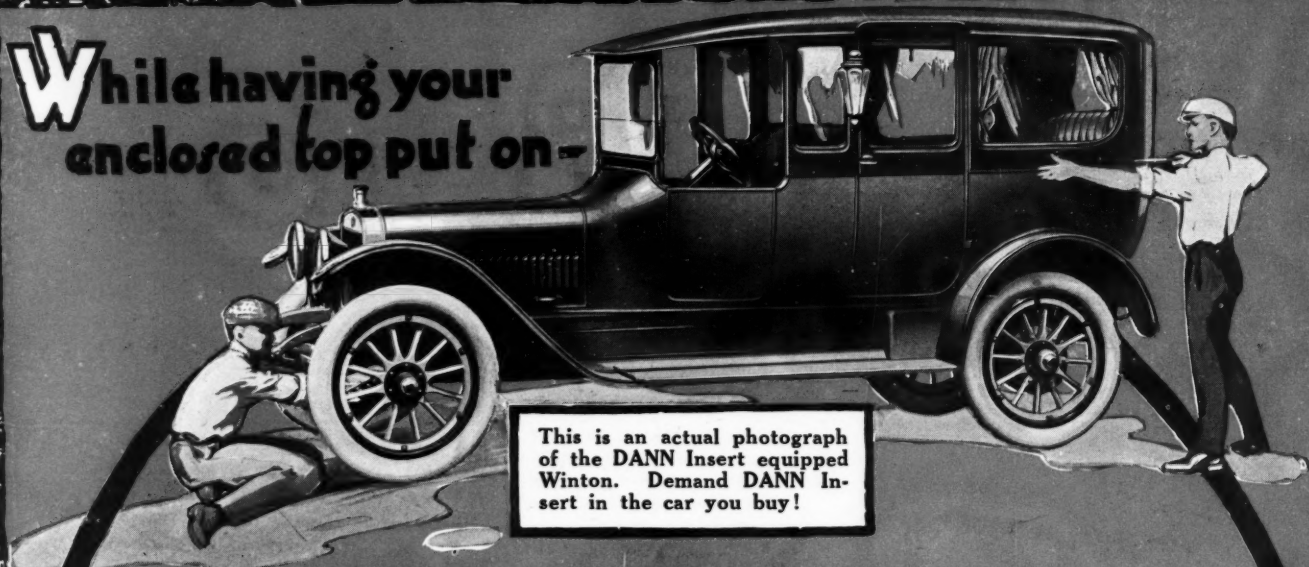
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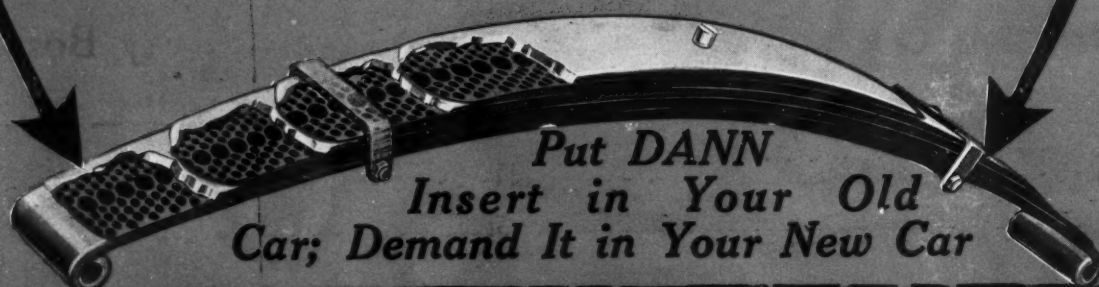
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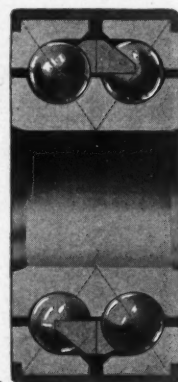
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—NEXT WEEK—

"The Passing of the Tester," which is the feature article of the issue of Motor Age for September 23, tells in a very interesting way how the factory chassis testers who used to give the motors and running gear their final tryouts have been superseded by mechanical and electrical devices which test far more accurately and quickly but mark the disappearance of one of the romantic figures in motor car building.

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MOTOR AGE

Touring in Comfort

By W. A. Lippman

TO gather the right things for a motor trip is as much a matter of common sense as of experience, though a few excursions will help wonderfully in knowing chiefly what not to take. It goes without saying that the requirements vary with the make-up of the party, whether or not there are children along and principally differing according to the ideas of personal comfort held by the tourists.

In our case, the arrangements and preparations for a western trip made last summer were based upon the experience of three former trips, each one adding to the sum total of travel information. One of the fundamentals for the enjoyment of a cross-country motor jaunt of any length is the possession of a large degree of patience and good nature—in fact, I should say that, next to a sturdy motor, good tires, 2 days' food supply and water bags in plenty, these two virtues are prime requisites—no more to be left behind than the radiator, carbureter or other vital part of the car.

Tow Rope First Essential

To pile spare motor parts into your tool box, under the seats, in your trunk, onto the running board, etc., is now a thing of the far distant past; but a word or two about the real necessities for first aid to your car will not be amiss. You will, of course, provide a good tow rope, 50 or 60 feet long, new $\frac{3}{8}$ -inch hemp rope of good grade, with a heavy iron hook fastened on one end with splicing; a better substitute or addition is a steel tow cable, such as you can buy at any good supply house and provided with hook on both ends and hemp loops for fastening to the spring, the correct point to

fasten a tow rope. It is well to remember that the rope never should be fastened to the axle, especially an axle of the hollow type, which carries a floating drive-shaft, for sudden strains on such an axle may crack or break the housing and an accident of this kind on the road might involve serious complications. A set of tire chains for all four wheels is accepted as a positive necessity.

Extra Spark Plugs Handy

A few new spark plugs are good trouble insurance—in fact, an entire set should be carried if you expect to travel into high altitudes, for many tourists have found that even with the correct gas mixture, a very fine deposit of intensely hard carbon

is left on spark plugs, owing to the rare atmosphere and the pre-ignition and back-firing which result can be prevented by a change of plugs, the old ones being cleaned at a convenient time. It is well to know that brass-bodied spark plugs are more apt to give trouble from loosening and consequent leaking and loss of power than iron-bodied plugs. Excessive engine heating, so common in the mountains, is due to high altitudes and the low boiling point of water.

Don't load your car with spare gears and bearings, unless your car is in the habit of burning out connecting rod bearings. In that case, an extra bronze or babbitt bearing or two will take little room and may come in handy, especially if you sometimes forget to provide yourself with oil when you have a long stretch ahead of you and burn out a bearing or two. At that, however, you will find in nearly every town of any size, a good garage and a mechanic who knows how to pour babbitt or similar bearings, and real good work is done by these newly-developed repairmen, most of whom have learned their tricks of trade because they were very far away from the base of supplies.

Bad Breaks Rare

There was a time when, even with a full supply of extra gears and parts, a motor trip was filled with long stops for repairing and patching, but the dependability of the modern car is such that one need not burden it with such paraphernalia. Serious breakages are now rare,



Ready to break camp after a night under the stars

and mostly due to careless driving, neglect of oiling or inadequate adjustments. Moreover, if one does have a breakdown, owing to a stripped gear or broken drive-shaft, differential or other driving member, the perversity of fate would decree that, though you thought you had brought everything along, the one thing needed was left behind. Most well-known car makers of today, and many not so well-

visible nuts and adjustment points of your car, to prevent by such examination the loss of bolts, clevis pins and the liability to damage or danger.

The matter of tools for repairs is best

understood by the individual driver, but it is better to have a tool or two over, than to leave behind the one you need, and this does not mean that you must carry a machine shop. You now can secure adjustable wrenches of such excellent quality and utility and combination tools designed for so many different purposes, that, with a little duplication for allowable breakage or loss, a tool roll the size of a shoe box and weighing perhaps 12 pounds, will be ample for a trip from New York to 'Frisco and return, and then some.

Clothing for the Tour

What to carry for personal comfort, and even adornment,—if one is so vain as to insist on having "good" clothes to wear at occasional "nice hotels"—calls for very careful study before packing up. The advice so frequently given of piling all your clothes and baggage into a heap and then discarding half may have value as a theory, but it is one extremely difficult thing to

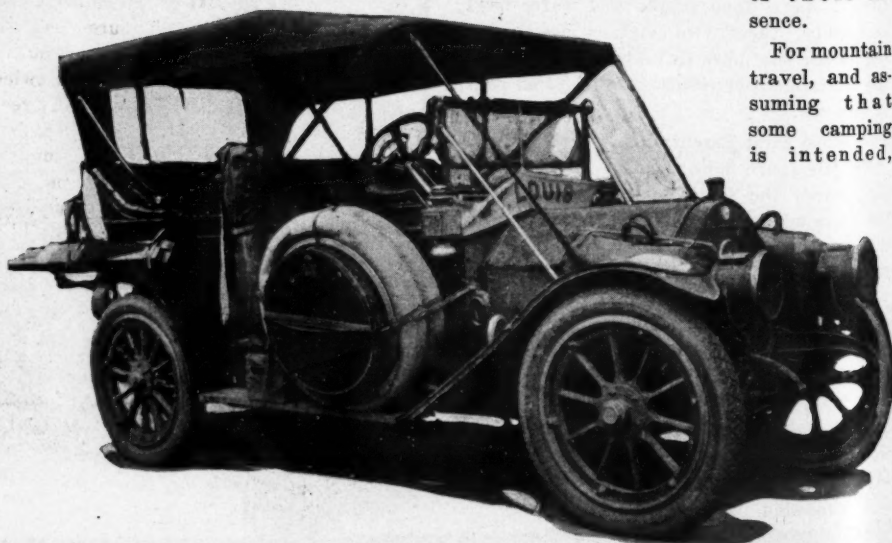
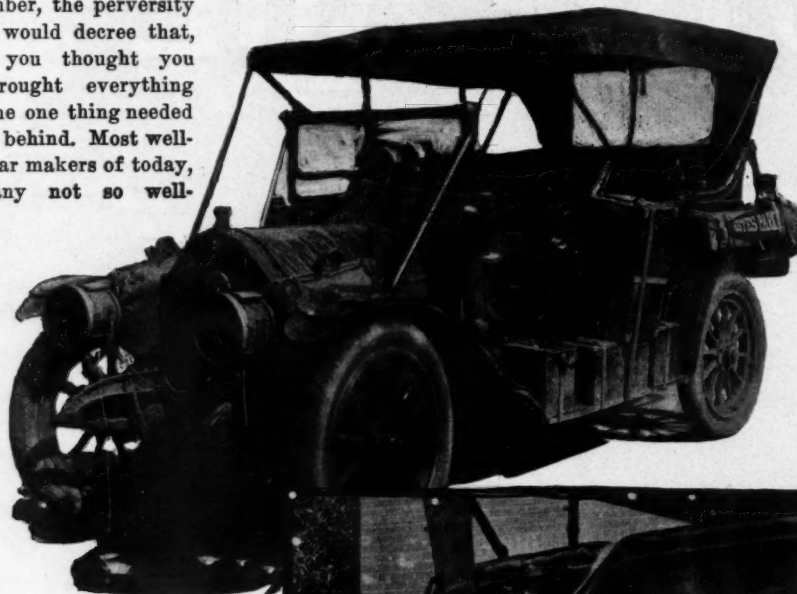
carry out. It is much better to carefully make a list of necessities and pare this list down until you feel the limit has been reached. You can always box up and ship back the things you find can be dispensed with; we have had this experience, and things so discarded were spared more cheerfully this way than had they been left behind and "longed for," because of their absence.

For mountain travel, and assuming that some camping is intended,

known, have branches or efficient agencies from coast to coast and one is never very far from a good stock of supplies; the farther west you go, the more complete these stocks will be found, since there are many large agencies that realize the value of carrying ample stocks of standard repair parts.

Spare Parts Box

To provide a good assortment of bolts in the sizes used on your car, with lock washers and nuts, cotter pins, clevis pins, machine and wood screws, nails of various sizes, especially a few large heavy gauge spikes, is a matter of ease, and the whole list will weigh very little and take no room to speak of. One of the best containers for carrying such things, together with spark plugs, extra gaskets and wire of several gauges, is a fisherman's fly-box about 4 inches deep, 8 inches wide and 12 inches long, made of tin, strongly joined at the corners and closing with hasp and lock. The box is divided into several compartments of various sizes. The one used by us has three trays, each having three spaces suitable for different sizes of bolts, etc. Rightly packed, such a box, while a veritable catch-all, will be found indispensable. At times the most amazing things find their way into it, as, for instance, a bent hat pin, a stray button hook, an extra length of rubber tubing and even odd bits of sheet tin, copper and brass. You will, indeed, be surprised at the number of times you can make use of these trinkets, especially if you are the kind of tourist who takes a peep every day or so at all the



The car packed for the road—upper illustration, left side; center, rear; and lower, right side

plenty of warm clothes are a prime necessity; wool sweaters and coats will pack snugly and when needed will be most welcome. Heavy undergarments are not advisable if enough warm outer clothing is at hand. Khaki trousers and shirts for the men and khaki or pongee shirtwaists and skirts for the women are ideal, cleanly, and can be washed, scrubbed, brushed or beaten and will give less worry than any other sort of fabric, and since the dust of travel and the stain of sun, rain and sand soon take the prettiness out of any clothes, you might as well be comfortable from the start and leave at home worry about good clothes and other finery.

Clothes should be packed in a motor trunk that has a good, tight-fitting lid, well held down by lock and snap fasteners and covered with a heavy water and dust-proof hood, one that fits tightly and is held on by straps.

We found it most convenient to carry our current supply of clothing in heavy canvas bags, fashioned very much like the carpet bag of old, having the same advantage of roominess and convenience, besides being waterproof, dust-tight, more flexible than a leather bag or suit case and much cheaper than either. These occasion no worry when covered with dust, sand and mud, and at the end of a trip if worn out, can be thrown away without appreciable loss. These canvas bags are new on the market, but can be had at any large, up-to-date sporting goods store and some trunk houses. It may be of interest to know that we carried two of these grips for thousands of miles resting snugly next to the engine between front fenders and hood, and this rather unique disposal of these bags was without injury to either the varnish of the car, the bags or their contents, and eliminated them from the tonneau where such items are usually carried, to the discomfort of the passengers riding in the rear seat.

A heavy canvas duffle-bag, another invention and convenience of the sporting goods manufacturer, is the very finest obtainable carrier for soiled clothing and for spare shoes, an absolute necessity. This device is simply a waterproof bag, shaped like a tube, with a puckering string at the top, which securely closes the sack against dust, and leather handles at the ends and side making it convenient to carry. Duffle-bags may be had in assorted lengths from 18 inches to nearly 4 feet, but we found the

30-inch size to be adequate for all purposes and possessing the advantage of being light, even when packed tightly. Clothing may be shipped with safety by express or parcel post in a duffle-bag. We found the packed bag an ideal footrest for the passengers in the rear seat.

We used a good tire trunk and if your car is equipped with side or running board tire carriers, you should provide a tire

great outdoors and the long winding roads is no fit candidate for touring and should stick close to the Pullman, the "first-class" tourist hotel and forget the motor trip.

A real tent, with screened windows giving ample protection against mosquitoes, gnats and flies, collapsible poles, waterproof in any storm, light and easily tucked away and as easily taken out and set up—

that has always been my ideal place to live in summer nights; but previous camping trips never had brought forth the ideal, and searching in every catalog at hand, and inquiry at tent makers and sporting goods houses revealed it not; so we planned it, and had it made, and named it what it was—Cozy-Cote.

Nine feet by 9 feet and 6 inches in size, with a height at the center of 7 feet 6 inches; we had it made with a 4-foot wall, reducing the rained



A touring tent with screened windows on all four sides

trunk. They are not costly and can be made a storage place for scores of little items. We used ours for sweaters, raincoats, rubbers, cameras and films, fishing tackle and a great lot of small things which we wanted convenient and still not interfering with the regular packing. We often kept a box or two of crackers, a few oranges and eatables of that sort in the tire trunk.

The Tent for Touring

When we started on this tour we had decided to camp as often as conditions would allow and so we took a complete camping outfit. Our selection of this outfit was guided by previous experiences in out-door living. Naturally, we devoured eagerly everything we could find in motor, outing and sporting magazines, and once or twice, with feelings of childish glee, actually read up on outdoor living in guide books. But alas! what one finds in such mediums is too often the theory of sportsmen put into attractive literary form, or accounts of camp trips, taken by expert campers whose hobby and genius for carrying out the most intricate detail are equalled only by the time and energy they seem to have at their disposal. Such information is only of suggestive value, at least that is the way it proved in our case; the sporting goods catalogs of the various large dealers and manufacturers are veritable storehouses of information and the man or woman who can sit down to a table filled with catalogs and pamphlets on outdoor sports, and not be filled with an intense yearning for the

angle, but making for decidedly greater comfort, and never, though we were in the rain over 20 days on this outing, did we have a single drop of water come through the roof, the tent being made of 10-ounce khaki duck, close-woven but not specially treated for waterproofing. A unique and happy addition was a 16-ounce duck float sewed around the edge of the walls with a flap at the end which could be drawn up making a threshold 18 inches high, a splendid protection against ground damp and also insects. As the illustration shows, there are windows—four of them—one on either side, at opposite corners, 18 inches wide and 24 inches high; in the rear wall there are two windows, 24 inches wide and 30 inches high, directly in the center, divided only by the middle seam. These windows, as well as the front entrance, were covered with English bobbinet, greatly superior to mosquito netting because of its strength and toughness. This was sewed into the tent fabric and at the front was divided down the center the same as the tent flap, except for a wide overlapping of the netting, which at this point was edged with two-inch canvas webbing; tape tie strings made it easy to close or open the front. The netting flap, of course, was inside the canvas flap. The windows were covered inside and out with canvas flaps, which, when not in use, were rolled up to the top and tied with tape. There were also tape ties at the end of the flap and iron awning rings in the tent walls, so the windows could be closed, and



A provision trunk that needs no explanation

on cold night in the mountains, this feature was much appreciated.

Our tent poles were made in three sections with tin ferrules on the ends. The pole ends were cut at an angle and fitted into these ferrules, making a strong pole, yet stowing away in small space when packed for carrying. The ridge pole was made the same way, but we seldom used it, because we had a heavy ridge rope along the peak of the tent and end guy ropes, one of which we usually fastened on the car and the other to a tree, fence, pole, or a 20-inch, ring-top, hitch pin.

Wood Stakes Long Lived

When we left home, we were afraid that the gum wood tent pins would soon batter to pieces and so we took an extra set of pins, made of angle iron, and very small and handy, but the wood pins stood the abuse of making and breaking camp dozens of times and when we shipped superfluous clothing home, we included these iron pins. A 5-pound sledge hammer with a long handle, useful for many other purposes, makes an ideal tool for driving tent pins. We kept ours fastened with two leather loop-straps at the very bottom of the toe board in the tonneau, where we also kept a light camp axe, as well as a small Pyrene fire extinguisher, an indispensable touring article.

This tent home is easily and quickly put up and taken down and has an infinite number of advantages over the lean-to type of tent so often recommended for motor travel, besides making a very nice and

comfortable temporary home. Our tent weighs 25 pounds, contained in its 16-ounce duck waterproof wrapper, which is simply a canvas square with the corners cut out and the ends cut, to make a snug package of it, leather straps holding it together and leather handles making it convenient to carry. The completed package measures

30 inches wide, 24 inches long and 10 inches thick. The illustration shows where this was fastened to the car. It takes



Spare parts box, filled with one hundred and one odds and ends

about 20 minutes for two persons to set up the tent and about the same time for one person to take it down and put it away. The tent poles and pins were carried in a 16-ounce canvas bag similar to a golf bag, only opening at the side instead of the end, strapped tightly and fastened to light angle iron frames above the fenders as shown in the illustration of the car. They gave no trouble and were out of the way.

Sleeping While 'Frisco Bound

In our party there were four people, my wife, myself and our two children; hence the sleeping arrangements in a commodious tent like this were simple. The children slept on floor beds made from the three car cushions covered with light blankets, a roll of clothing for pillows and a heavy blanket and cotton quilt for covers. They never slept better on their felt mattresses at home than upon these cozy soft cushions on the ground. We slept on Gold-Medal army cots, made of staunch folding wooden frames with khaki canvas covers. These cots make comfortable beds, though it must be remembered that, because of the lack of mattress, they are much colder

than a bed in the same climate and more covers should be provided.

The nights in the mountain country are very cold, even in the middle of summer, and the plains and prairies get extremely chilly after the hottest days, and this should be borne in mind when selecting bedding to take along. Light, close-woven woolen blankets are the best and easiest to care for. The cots mentioned have a bag sewed on at the head and into this bag any sort of clothing, sweaters or coats may be packed, making a very satisfactory pillow. When folded up, the cots take a space 6 inches thick, 7 inches wide and 36 inches long. Here again we used the canvas bags, made like a golf bag, with an ample flap at the top and provided with straps for tight closing and leather grip handle for carrying. The use of this waterproof canvas for all wrappers and wherever it is desired to protect against dust and sand and dampness is a foregone conclusion, and while it may seem to have become an obsession with us, it was the means of saving us the unpleasantness of which so many tourists complain, that of dust and grime getting into everything in and about the car.

It no doubt has occurred to you that the fellow who insists upon his 9-foot sheet is apt to feel like invoking the Missouri law which compels public lodging houses to provide sheets of that length; however a camp is no place for quibbling about details and the blankets spoken of are enough and by thorough

shaking and airing can be kept clean enough for fastidious travelers. We packed ours, folded to the right dimensions, in a flat canvas pack, strapped tightly and fastened on the rear luggage rack as shown.



First aid kit packed in fishing tackle box

If you have never stowed four people away in a 9 by 9 tent you cannot know how you will long for a clothes closet or two. Just about the time you think you have everything put away for the night, you discover the heretofore forgotten clothes you still have on your back and are unable to imagine where they can be put so that you can lay your hands on them in the morning without having to walk over a pair of sleeping youngsters, as in our case. Thanks to the campers and their ingenuity, a very clever clothes rack has been made in the shape of wire hooks with loops that fit around the tent pole and fasten tight with a turn buckle. It is instantly attached and detached. You may have trouble in getting this device and even rummage around among the sporting goods shelves until you find it as we did. The Abercrombie house in New York makes it and you should have at least two.

Do not forget to take a small toy broom with you; it is your only chance to do housecleaning and will serve equally well for tent floor, car and clothes.

Simple Cooking Outfit Best

As to the make-up of the cooking equipment, there are as many opinions as there are campers, but the simpler the outfit, the less trouble you will have with it and the more likely you are to have satisfactory food. That, after all, is what you will demand of it. Needless to say, the ability of the camp cook determines the usefulness of the cook kit and its selection had better be left to the wife and then mildly censored by the head of the family.

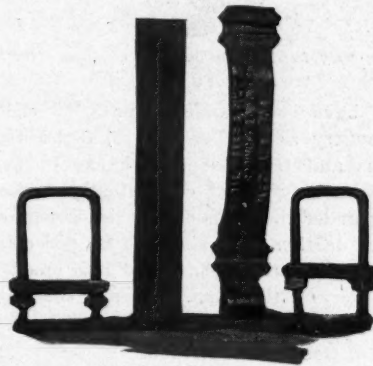
We bought a ready-made outfit, Wilson's Kamp Kook Kit, by name, one in which all the utensils nested and fitted into a closely covered stew pan, which slipped inside the iron fire frame. This frame makes a good stove except in windy weather and then you can find a sheltered place for it or scoop a hollow in the earth, leaving about one-fourth of the grill above the ground; the highest wind then will only make your fire hotter. You can use your engine hood for a shield if you like.

This brings up the subject of fuel while on the prairies. Do not overlook your supply, for while there is nothing serious in having to chase a half-mile around your camp for firewood, you may leave a few streaks of blue atmosphere in your wake when you find that nature was very unequal in her distribution of timber. Frequently you will come upon an old packing box, or a rotted railroad tie, perhaps a fence post or rail; but because of the open plains and the use of concrete or iron posts (where there are posts) I have spent many a weary half-hour hunting for boards. Buffalo chips are plentiful, and make good fire, too; but if you

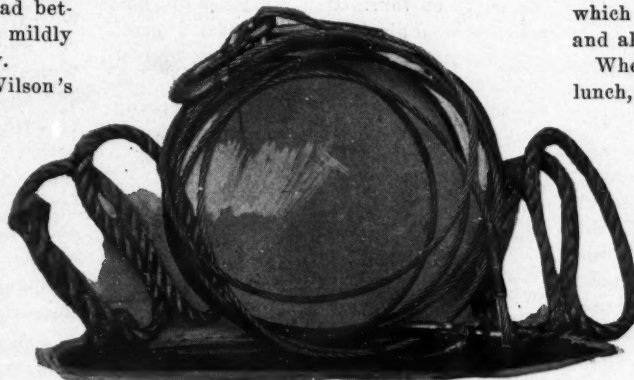
remember to pick up a few broken boards during the day and stick them into your luggage somewhere, you will be saved this. To build a fire with damp wood it is not a hard trick, especially if you take along a package or two of German Camp Fire-maker, which is a condensed by-product of petroleum. It will help you start a fire anytime, especially if you whittle a few of your kindling sticks fan-shape.

Keep Your Matches Dry

If you have camped during a season of wet weather, you know enough to take along a waterproof match safe; if not, well, then you may find out by experience that the Boy Scout trick of making fire by rubbing two sticks together is some stunt. Better take a good box that will



Effective and cheap spring repairer



Motorist's friend in need—steel tow line



Canvas valise, much like old carpet bag, roomy, cheap and immune to punishment

keep a reserve supply of matches always dry and handy. We used one made of hard rubber with a screw top. One of the handiest things we had around the place was a calcium carbide lamp with a strong lens. One filling of carbide lasted 6 hours; 1 pint of carbide lasted the whole trip; this lamp provides a strong light and steady in the strongest wind.

We covered our cook kit with the ever useful canvas bag. My wife says the camp stove was all right last year but she hankers for a one-burner gasoline stove, the kind that every wagon camper seems to have. And why not? You have the gasoline with you and a gas stove can be rigged up to take very little room and it certainly does beat a wood fire for quick and sure cooking, especially if your wood is damp, and you have to get down on your knees and coax it with all the wind your lungs can raise and even when you do get it going, your eyes are full of smoke. Gasoline stove for us next time.

Aluminum Cooking Utensils

My wife gave me this list of absolutely necessary cooking utensils, all of aluminum, if possible: 1-gallon coffee pot, with riveted handle, for coffee, tea, boiled eggs, heating dish-water and bath-water; a spider frying pan and a stew-pan that will hold the contents of a food-tin; one large stirring spoon and at least two good sharp knives. Take a bundle of old soft rags and include oblong pan with cover, in which to pack these utensils for carrying and also for washing your dishes.

When you are in a hurry for a roadside lunch, not taking time for unpacking and yet hungry for something piping hot to drink, try the new solid alcohol. It comes in a can. One brand is called Sterno Canned Heat and a wire stand comes with the can. You light the open can and the solid melts and burns with a light blue flame that is hot enough to boil water in a jiffy. At such a time, instant Postum or soluble coffee, either of which require only boiled water for a perfect drink, will be found a boon to campers.

The best place we found for the cook kit was on the running board, as shown. It furnished a good foundation for the cots. Before we strapped them together and onto the car, we put our shovel between them. This place seemed to be the safest, where it could ride without scratching or injuring the car. Likewise when the cots were fastened on, we slipped the handle of our largest desert water bag over the top of the bundle. The bag rode here safely and was always in the open air and because it was ventilated, the water kept sweet and cold.

Water bags are real touring necessities, and you should take two at least. We had three, two

of them holding 2 gallons each and the third of 5-gallon capacity. You never know when you will be out of reach of good water on the prairies and much of the water you do get is decidedly alkali, unfit to drink and almost as bad for the radiator and connections as for the human stomach. Use desert water bags and avoid this worry. They can be bought at any large sporting goods store and all the hardware stores out west carry them. Soak them well when filling and remember to keep them well filled.

A whole lot of very fine people believe that traveling via the camping-out route means depriving yourself of all the conveniences and comforts of home. Now we did not go so far as to take a portable bath-tub, though it must be admitted there were many times when, had water been available, such a device would have been welcome, but we did take a camp folding table, and what a blessing it proved to be when we stopped a day or two instead of merely overnight. To have a clean place to set piping hot food fresh from the camp fire, to have that high enough off the ground to let you sit up to it and stick your feet under is taking just a little of the shine of civilization into the tall timber with you and is a mighty welcome addition to your camp outfit. Our table is a Gold-Medal folding type, with collapsible legs, the whole affair being only 4 inches thick, 6 inches wide and 30 inches long when folded up. It took only an instant to fold it and it was as quickly slipped into a canvas bag and attached to an angle iron carrier over the fender as shown.

Of all the things which make the life of the motor tourist delightful, none appeals to the average person more strongly than the vacuum bottle, with its equal facility for keeping hot things hot and cold things cold. We carried three 1-pint vacuum bottles in our commissary trunk, as shown in the illustration, and also two 1-quart bottles in a sole leather carrying case. Naturally those in the trunk were our reserve supply and the others for current consumption.

Carrying Food on Road

And the suggestion of vacuum bottles brings us down to the base of supplies, for the tourist, like the army, travels on his stomach and the feet of his car and if tires are poor or undersized, or if food be of the wrong kind or unequally balanced, then the tour will lose some of its pleasure and surely some of its comforts. Our provision trunk, designed by us, is 12 inches wide, 24 inches long and 12½ inches deep, well covered with waterproof fabric, lid and box carefully joined, for dust and grit from the road will work into almost any trunk or box unless joints are well made.

The illustration shows the trunk packed for the road, the vacuum bottles were used as patterns for the spaces they occupy, and they ride there without danger of breakage, since they fit snugly. Two of



One way to dress a boy for a motor tour

them have been carried over 8,000 miles of country road. The knives, forks, teaspoons and tablespoons with can opener, etc., are safely and conveniently tucked away under the loops on the lid; a pair of crossed leather loops also hold six porcelain plates; porcelain cups, nested into one lot, take very little room, and are the only practical kind to use.

Canned Goods Best on Tour

The food supply for camping is quickly and easily settled according to the size of the party en tour. It is a matter of common sense to always keep at least 2 days' food supply on hand, thus guarding against contingencies. It is hardly likely that anything serious will develop requiring that amount of food, but it is nice to know that there is plenty should it be really needed.

The kind of food to provide depends upon your taste. Nowadays, you can secure the best of food in tins but it is well to remember that a food box on a summer day gets fairly warm and canned food should be of the best and used within 2 to 3 days after you buy it. Chipped beef, peanut butter, bouillon, soup stock, and other staple supplies that are put up in glass or porcelain jars are safest and can be had at most any good grocery along the road. We carried a small refrigerator in which we kept butter and jars of food such as would keep when opened, also eggs packed in corrugated paper boxes.

Excepting for fresh milk bought by the roadside at or near stopping places, we resigned ourselves quite early to condensed cream and milk; we always bought the five cent size and the tang of out-door eating made us enjoy the tin-cow almost as much as the real goods. Fresh bread can be had anywhere, and a farm house will frequently serve as a bakeshop if you happen around shortly after baking.

Many tourists hesitate going west of Missouri or Iowa, being under the erroneous impression that fresh supplies and food cannot be had at convenient points. As a matter of fact, the western stores, be-

cause of the dependence placed upon them by the communities they serve, carry surprisingly large and up-to-date stocks, and since almost every grocery store is also hardware, dry goods, shoe, and not infrequently drug store, we found little difficulty in getting whatever we wanted at any stage of the route.

It would be an incomplete account if I failed to tell you of the very simple medicine chest we took along, consisting of course of a few standard first-aid remedies such as every family keeps in the medicine closet, enlarged by a few specialties such as sterilized gauze and bandage cloth, with a roll of adhesive tape and a tiny glass-stoppered bottle of carbolic acid contained in a wooden case for snake bites or any poisoned wound. These were all nicely packed into a fishing tackle box, and a more convenient and cheaper container would be difficult to find.

So much has been written about seeing to the car and its equipment that it seems a waste of space to dwell further on this, but one cannot say too much about the necessity of using good tires and starting out with new casings all around with at least one new casing on your spare rack, or still better, two spare new casings. We took three, two new ones and an old casing. If you expect to travel several thousand miles, this injunction is readily understood and if disregarded, will not be overlooked the next time you start out. We carried seven extra tubes and thought we were foolish until we came across Wyoming and had five flat tires one hot day and the very next day two more and because roadside patches are uncertain and bothersome to attach, we were mightily relieved to arrive that night at a good town where tubes could be vulcanized over night, a service, by the way, that can be had in many towns in the west, nowadays.

Used Canvas Wash Basin

A wash basin that will hold a-plenty, costs but a little and when not in use folds up as flat as a 10-inch flap-jack—that is Abercrombie's canvas basin—made with a steel hoop around the top edge and is an all-around useful utensil. If you are fussy about putting it away wet—tie a string to it and hang it on the car somewhere; 20 minutes in the air will dry it. With a canvas basin to begin and finish bathing in, your next step is a folding canvas bucket. Ours held 3 gallons and folded flat so that it nested into the basin.

We were never without a roll of cheap paper toweling with its thousand uses. This can be bought in any large town at drug stores or racket stores. A celluloid soap dish, with Lava soap, is indispensable and we kept this in the tonneau door pocket.

To wrap your springs, front and back, with electric adhesive tape is inexpensive perhaps and will take an hour or two before you start but may save you a lot of trouble. The tape is elastic enough so that it does not interfere with the full

action of the springs and it will keep the dust, sand and grime of cross-country travel from being drawn in between the spring leaves at every jump and bump. Not only will this render unnecessary the taking apart of springs on your return for cleaning out grit, but will keep your car riding easier en route. Good springs are a prime requisite to motor comfort.

An efficient spring repairer should be carried. The one illustrated here was used by us last summer. It costs \$1.25 and is made up of a flat piece of iron, shaped to fit over the spring clip. On either end there is a slot for holding the clips provided, and when the nuts are tightened down, these will hold the repairer tight. On our way back last summer we broke a front spring—two leaves, including the main top or long leaf. This occurred 9 miles east of Cheyenne, on the open prairie. We stopped for lunch and in an hour we had lunched, put the repairer on and were on our way. It held the spring in place to St. Louis, over 1,100 miles, and until we took it off a week after our return, there was no element of danger or risk.

If you look at the pictures closely you will observe that our luggage was fastened on with web straps. If you ever packed your car with a dozen or more pieces of baggage and used leather straps, you learned something about the inflexibility of cowhide—also you learned to swear better, if your education along these lines has been neglected. Long ago I threw leather straps out as impracticable. Web straps are cheaper, more easily adjusted, can be water soaked repeatedly without harm and will outwear leather. We found two sizes that suited our equipment, one size was 1 inch wide and 5 feet long and the other 1½ inches wide and 8 feet long. In the west, most harness stores sell them and in the east trunk houses have them or will make them for you. The many uses they can be put to will surprise you. They'll mend a broken top-bow, tie up a heavy bundle, help hold a broken spring leaf, and I have used them to hold on a tire boot after the lace-holes had worn out.

Carrying Extra Gasoline

To find yourself out of gasoline at the bottom of a hill in the city may seem a joke to you, especially when all you need do is step into the first drug store and telephone a service station to send you a 5-gallon can. But let that happen out on the open road when you are 20 miles from the nearest supply source and then you'll wish for Aladdin's Lamp. You might be able to use the coal oil to get in on. The spare gasoline kits strapped on our running boards drew laughs from the uninitiated friends at home and en route. There are even motorists who have traveled 100 miles away from home in their car who scorn the idea of carrying more gasoline than their tank will hold. Let 'em laugh and let 'em scorn; you will en-

joy it too when you suddenly feel the car slow down and the purring stops and, after a hasty look around, you find that the juice is gone. Did you ever have it happen to you? We have. Did you ever notice that the jinx which sometimes takes a ride with you will always see that your tank goes dry when you are sure there were scads and scads in it and more than enough to run to the next supply point, and when the old boat shakes herself and settles down in the mud with a gasp or two and then chortles off into Sphinx-like silence you look around you, take two glances at the speedometer and another at the guide book and find you are just about half way between towns and 10 or 15 long weary miles either way?

Cans for Supply Fuel

Don't do it. Take extra gasoline kits with you; the kind we take on our trips are continued in a black japanned box that fastens on the running board. Each box holds two cans with a gallon and a half capacity each. With two of these boxes we always have 6 gallons of engine feed extra and that would get us 60 or 70 miles after the tank went dry. Twice it did it too. No stirring away out of the reach of smooth roads and frequent habitations for us without these life-savers.

Of less importance, because a unit of oil lasts so much longer, is the matter of extra oil. Most of the oil in small towns is the cheapest variety, all right for harvester and traction engines, but not fit for a sensitive motor with epicurean tastes. Take a gallon or 2 of your own oil with you and keep it for emergency use when you cannot get good oil, or you may need it on the road after a nasty pull up steep grades or through sand draws. A long wallow through mud and clay on western plains with high altitude will eat oil fast. It is cheap insurance and the cans are easily strapped onto the running board.

You may not care for goggles ordinarily, but if you travel west, especially if you cross the desert or take to the plains, remember that afternoon travel westward against the shimmering sand and prairies demands goggles; blue glasses suit some folks but we had greater satisfaction with amber. If you wear glasses you can do as I did, have your optician grind your prescribed glasses into goggle lenses for you in the large Toric style, fastened in good strong goggle frame and protected with gauze around the edges. I found it paid me to have both clear and amber goggles made up this way. It made long drives less of an ordeal.

Reading articles about transcontinental touring, you perhaps have noticed warnings to guard against the ruts and high centers in many of the prairie and desert roads, and for that matter some of the mountain roads. This is good advice. The Lincoln highway in western Nebraska and Wyoming has many miles of road where a car with low center pan, or axle must be careful to avoid high centers. Between

North Platte and Cheyenne many miles of such roads will be found and it is said these ruts were worn years ago by the travel of prairie schooners going westward over the line of the Union Pacific railroad. You will save your nerves and perhaps prevent adding your sodpan to the collection along the roadside, as noted here and there, by careful running out of the ruts, for the chuck holes made by the woodchucks and prairie dogs now and then are in a rut and once you are in one of these deep ruts you stay there until you come to a place to angle out. A chuckhole run into suddenly may mean a smashed sodpan, a broken spring and occasionally you will find a tourist that will tell you of a broken crankcase or a cracked axle housing. It pays to observe "safety first" here as much as on State street, Chicago, or Broadway, New York.

A few road hints will not come amiss. Never take much stock in road directions or distances given to you by the average native unless he happens to drive a car. Distances out in the woods and plains are not paced off with a speedometer and I have frequently been told by a native that I should take the very next road and turn to go to a certain place, only to find the road impassable some distance ahead.

Local residents usually judge the roads from horseback or buggy seat, distances are more frequently measured by the length of time it takes to get from Bill Smith's house to the village, and ruts, gullies and fords mean nothing to them.

Stick to Your Blue Book

Get all the advice you can and then stick to your Blue Book like a burr. Leave it and you will get into trouble sure. Of course you may sometimes get into a peek of trouble by following the guide, for even Blue Book publishers make errors at times. Apparently there are still type compositors in the land who adhere to the old printing shop motto, "follow copy if it goes out of the window," and printers' errors result, but in the main you are safer staying close to the mileage in the book. I recall that one route out of a western city gets you through the business section all right, but instead of a left-hand turn, then a right turn, the book tells you to turn to your left one block, then one block further on, turn left again; this brings you right back into the business section again. Either the pathfinder went back after a package of smokes or a bottle of something and forgot to leave out one turn, or he was seeing things.

If you find it necessary to get off the road as marked in the Blue Book, ask careful directions as to getting back onto the route ahead at the earliest point. In many places where detours must be made, local authorities, garage men or motorists put up turn-out signs and instructions.

Important highways are now marked for most of their length. This could not be said last summer, even of the Lincoln highway, the Pike's Peak trail, Old Na-

tional trail or the Sante Fe trail, but great strides have been made, according to reports, and it will be harder than ever for the careful motorist to get off the trail he starts out on.

The local garage man is usually the best authority on road conditions. He goes over the roads frequently and gets reports from tourists and local motorists.

When you find anything dangerous in road conditions as you go along, leave some sort of warning, if possible, for following cars and report at the next garage. Your efforts will be appreciated.

Do not lose courage if signs are missing on a road where signs are expected to be. So long as you are sure your mileage is all right and you are with the book, stay with it. Before long you will see one of the familiar boards you are looking for, and the absence of signs along the trail behind you is usually explained by the antics of a careless hunter, still more thoughtless passing boys, a tramp who wants fuel or even a mad bull or an un-

derfed goat in search of a real solid meal.

"How far do you travel in a day?" That is perhaps the most frequent query put to us. On two previous long trips, one east and the other north among the lake regions, we made averages of 100 and 125 miles for every day of travel. The weather on both of these trips was much hotter, however, and the inducement to make short runs great.

What did the trip cost? Well, whatever it cost it was worth many times the price—to be free to go as we pleased, to make our own train schedules, to tarry where and when we pleased, to live under the rule of no man except an occasional suspicious "constibule,"—all a delight and pleasure different and distinct from any other method of vacationing.

The exact cost will vary as the cost of any trip, according to taste and demand. Here follows the cost of this trip:

FOOD AND BOARD	
Food supplies.....	\$74.90
Hotel and lodging (11 days)....	62.55
Camp supplies.....	9.60
	<hr/> \$147.05

TRAVELING EXPENSE

Tolls, road and bridge.....	\$ 1.45
Garage fees.....	5.25
Gasoline—346 gallons (average 17.1c).....	59.20
Oil—86 quarts (average 15c)....	12.40
Grease.....	2.00
Tire repairs (including liners, etc.).....	20.90
	<hr/> \$101.20

MOTOR CAR MAINTENANCE

New pinion gear.....	\$11.00
New driveshaft.....	8.35
New spark plug set.....	7.75
Miscellaneous supplies.....	4.90
	<hr/> \$32.00

REPAIR TIME

Repairing magneto.....	\$ 1.50
Replacing connecting rod bearing.....	5.00
Carbon cleaning (by oxy-acet).....	3.00
Putting in pinion gear.....	4.00
Washing and cleaning.....	2.50
	<hr/> \$16.00

Miscellaneous unclassified expenses....	\$ 48.00
	<hr/> 19.30

Total trip cost.....	\$315.55
Camp outfit and permanent supplies bought previous to starting, almost all of which became stock property, good for years to come.....	\$125.00
Tire wear, calculated at 3c per mile for casings.....	83.40
And, 1/4c per mile for tubes, based on ample experience and accurate cost keeping.....	6.95
	<hr/> Grand total.....\$530.90

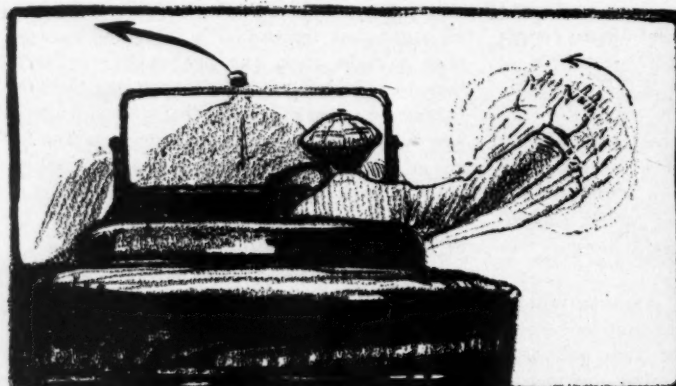
Signals Drivers Should Always Use in Traffic



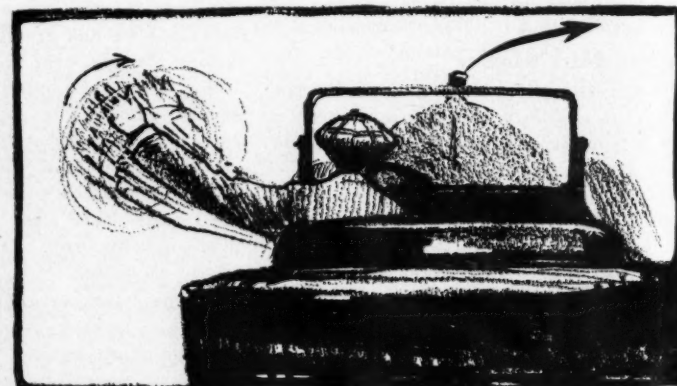
Signal 1—When driving in a city, town, village or on a country road, get into the signal habit. When stopping, if the steering wheel is on the right-hand side extend the right arm horizontally. This means you are going to stop. It is a warning to cars that are following you. This signal also means that you are going to turn a corner to the right, as the illustration shows.



Signal 3—If you have a right-side drive car and you want to turn a corner to the left, you extend the right hand as illustrated and swing it in a circle about 2 feet in diameter in the direction indicated by the arrow. Swing it slowly and perhaps not more than three or four times, depending on whether you are on a crowded street or not.



Signal 2—This is for a car with the steering wheel on the left side. The signal is to extend the left hand horizontally, which means either that you are going to stop or that you are going to turn a corner to the left, as the illustration indicates. This signal is identical with No. 1 excepting that the other hand is used.



Signal 4—This signal is for a car with the steering wheel on the left and the signal is intended for the case in which you are going to turn a corner to the right. The left hand, as illustrated, is slowly swung in a circle of 18 inches or 2 feet in diameter, three, four or perhaps more swings being given.

Motor Trucks Aid Army in Patrolling Mexican Border

Engineers Forced to Construct Roads Through Texas Wilderness to Get Supplies to Troops Operating Against Outlaw Bands

FORT SAM HOUSTON, Tex., Sept. 13—What is said to be the severest and most practical trials that were ever made of motor trucks and motor cars in actual military field service by the United States army are now in progress in the lower Rio Grande region of Texas where more than 4,000 troops are operating against raiding bands of Mexican outlaws.

The conditions under which the new adjuncts to the transportation department of the army are being operated are particularly trying. The border country is almost entirely lacking in good roads, with the exception of a limited system of improved highways radiating out of Brownsville and extending only short distances to nearby towns. In order to reach many of the more remote patrol camps with motor trucks carrying supplies, it was found necessary to cut a road through an almost impenetrable wilderness of chaparral. The low-growing brush that covers the whole country is all thorn-bearing. The mesquite, the cats-claw, the prickly pear and a variety of other plant life, indigent to the border, are covered with thorns that are an ever-present menace to tires. The lack of any convenient repair shops makes it necessary for the motor transportation equipment to provide its own means of upkeep.

It requires a considerable amount of supplies to keep an army of 4,000 men going and the trucks are kept constantly busy. It is planned to greatly increase the number in service. It is also announced here that the war department, acting on the recommendation of Major General Frederick Funston, has ordered four large and unusually strongly built motor cars of the touring type, to be used in the quick transportation of small detachments of troops from place to place upon the border.

In former years, when the war department maintained large garrisons of soldiers at Fort Brown, Fort Ringgold and Fort McIntosh, all military posts on the lower Rio Grande frontier, there was a government road that extended up the river for a distance of about 250 miles, connecting these different stations. The abandonment of the road for military purposes several years ago caused the highway to rapidly fall into bad condition and there now are long stretches of it that are impassable for almost any kind of vehicle. Temporary improvements have been made recently to some sections of the old highway and plans are on foot to rehabilitate it along its entire length.

It is stated that the motor trucks which are now in use on the border have proved equal to the many hard tests that they have been compelled to undergo. The

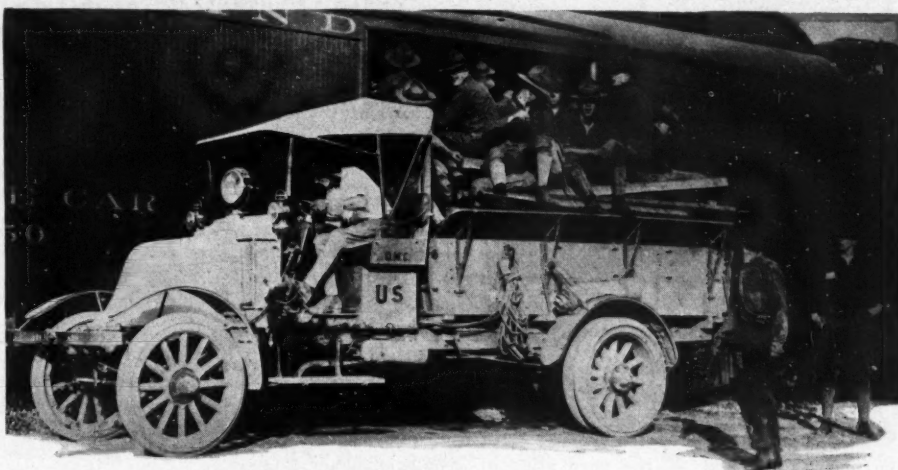


Photo by Underwood & Underwood, N. Y.

Motor truck being loaded with supplies for troops in camp on the Mexican border

chief difficulty has been the lack of roads. The patrol camps are often situated close to the river bank in localities that are almost inaccessible.

PACKARD MEN FOR ARMY

Detroit, Mich., Sept. 11—The Packard Motor Car Co., which employs 9,000 men, has fallen in line with the movement of the national and state governments to promote and encourage military training among the civilian population. The Packard board of directors, at a meeting held this week, passed a resolution to the effect that any Packard employe shall be granted leave of absence at any time he is eligible to take part in any military tour of instruction, naval reserve cruise or national guard encampment. It is expressly provided that such leave of absence shall carry with it full pay for the entire period of military instruction and that the time shall not be deducted from the employe's regular vacation.

GUYOT GETS SHORT FURLOUGH

Paris, Aug. 28—After 13 months' active service at the front, during which time he has driven the general in command of one of the French army corps, Albert Guyot has returned to Paris on his first leave of absence for 6 days. Guyot's life has been a series of adventures, for the army to which he is attached is at one of the most critical points of the battlefield and has the forces of the German crown prince opposed to it.

The French race driver describes the motor car as one of the most essential instruments in modern warfare. Even at the present time, when the opposing troops are buried in 6-foot trenches, only 150 yards apart and progress either way is a matter of inches, often secured at tremendous


loss of life, motor cars are indispensable. Large numbers of American trucks are employed by the army to which Guyot is attached, most of these trucks being Packards and Whites.

At the present time the motor service consists in carrying ammunition and food from the depots to the trenches; in taking fresh men to the trenches and bringing away the men who have finished their spell of duty; in moving wounded from the dressing stations to the main hospitals or hospitals trains; and in carrying material for mine digging and entranching. There is no present use for armored cars, but the artillery is making extensive use of tractors for quick transportation of their guns from point to point.

Guyot, who was one of the first men to learn to fly a Bleriot monoplane, expects to enter the aviation corps as a pilot within a short time.

THOUSANDS AT FAIR SHOW

Indianapolis, Ind., Sept. 11—The motor show, which closed here tonight and held under the auspices of the Indianapolis Automobile Trade Association in connection with the state fair, was the most successful of any show or exhibit ever held in Indianapolis. Although no admission was charged and no system could be obtained that would give an actual check on the attendance, it was estimated that over 125,000 visitors attended the show, and that fully twenty-five per cent of the state fair visitors attended particularly on account of the motor car display. Officials of the trade association believe that if a wonderful exhibit like the one just closed can be given with such tremendous success in a tent, it is fair to assume that even better records can be made if the state fair association would provide a pavillion.



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The Incompetent Repairman

WITHIN the last few months an agent for a prominent make of car in a city of over 25,000 in the Middle West lost the agency because his repair department was quite inadequate, so much so that repair jobs rarely gave satisfaction and the factory was charged with incompetency through this particular dealer.

ALL dealers have not good repair shops, some have, but unfortunately many garagemen and dealers are somewhat below par when measured by the yard stick of repair efficiency. One car owner paid over \$70 to have a new water pump installed on his car, not fewer than two pumps being broken before one was attached properly and yet the owner had to pay the bill for the pumps that were broken.

RECENTLY an owner with a missing cylinder had his motor taken apart and put together only to find that the trouble remained. A bill of over \$50 was paid and the trouble not corrected. A competent repairman was able to correct the trouble and the bill was less than \$2.

WE have with us poor doctors, poor lawyers, poor ministers, and poor actors, but fortunately they are not so well paid as the good ones. In the repair field we pay for labor at 90 cents an hour in some cities, 75 cents in others and as low as 40 cents

per hour in others and yet we do not get what we pay for. We pay the bills and fail to get the desired results. If we take our watch to the jeweler we look for a new part being put in or a repair made, but we go further and demand that the watch keep better time or at least accurate time when it comes out of the jeweler's. We have a right to expect the same thing from a repairman. If he is to be paid his bill he should do the work and do it properly.

THE public has been imposed upon to an amazing extent by hopelessly inadequate motor car repairmen, garages in many cases having for repairmen adults not even familiar with all of the constructions of motor cars. There must be a remedy, otherwise reduced sales will surely follow. Our country is not so large but that we could issue qualification certificates for competency in garages. Garages could be sealed according to their quota of efficiency in help and workmanship. This was done in several countries in Europe. Those garages that did poor work lost their official positions. The owner will sooner or later demand such a condition in America. The car owner does not object to paying his repair bill providing he gets good work done, but rightly objects when he finds his car running more poorly after the repair than before; or finds that some parts have not been put back into their proper place by the repairman.

Electrically Human

THAT period of the year is approaching which places the heaviest load on the electrical system of your car, namely, the load of electric lighting during the long fall and winter, a period when the amount of driving done in the daytime is often too short to keep the battery well charged and also a time when the speed of driving is materially cut down because of being more in the cities. Then, too, the electrical load is heavier because motor starting will be heavier, due to cold motors, congealed oil, etc.

WITH this situation in view, the owner must be prepared to do his part to reduce this excessive load on the electrical equipment. Much can be done that will perceptibly lighten it. The electrical equipment should be gone over, particularly the generator. The brushes may need cleaning and other attention. The same is true of the starting motor and its operating parts. Carburetor adjustment should be looked into. A shutter valve may be necessary for easy starting. It may be well to attach some adjustment to the needle valve, so that a greater flow of gasoline can be had for starting. Valve timing can be checked up, and, in short, it will be beneficial to generally clean up the ignition system so that every part of it is in the best condition.

IF the battery is not well charged, it should be turned over to be well filled up and should any cells need replacing or more liquid be added, now is the time to give these matters attention. Get the entire system ready for the start of its heavy season, rather than taking the chance of having more or less trouble and inconvenience with it as the winter season comes on, only to find later that the system has suffered materially by being neglected. A stitch in time saves more than nine.

Reducing Truck Accidents

MORE legitimate use of the mirrorscope on the side of the dash of trucks to show the driver the view behind would have a beneficial effect, particularly where trucks are used in suburban and country work. Often the truck is too noisy to let the driver hear the sound of horns on touring cars trying to overtake him. Added to this is the difficulty of the truck driver looking to the rear because his view is entirely obscured by the enormous truck body.

TO date, New Jersey is about the only state that has legislated requiring mirrors or other devices to fill this need. Other states should adopt such desirable legislation. The police boards in many cities would be working in the interests of better regulation of traffic and the reduction of accidents if they had similar regulations.

Joy Upholds Motor Age

President of Lincoln Highway Criticizes Salt Lake Route

Road North of Lake Is Best Course Through Utah

SOME time ago Henry B. Joy, president of the Lincoln Highway Association, wrote to Charles Tyng, consul for this highway in Utah, concerning the best transcontinental road across Utah, in which he recognized the superiority of the north route from Ogden to Reno, and which is not the Lincoln highway route, as compared with the southern route between Salt Lake City and Reno, which is the Lincoln highway link.

Last spring, Motor Age, on the recommendations of the Automobile Blue Book Co., recommended the northern route for transcontinental travelers, as compared with the Lincoln highway, or the southern route between Salt Lake City and Reno. At that time officials of the Lincoln highway and many of their friends opened a crusade of criticism against Motor Age, apparently on the ground that they thought Motor Age should boost the Lincoln highway irrespective of whether it were the better route between Salt Lake and Reno, or not. President Joy in his letter referred to says:

"There is no doubt in my mind after having driven the southern route in June, and having talked with dozens of tourists, and citizens of Utah, but that the northern route today is the most drivable road."

Thanks, Mr. Joy. We knew you would only have to go over both routes, to convince yourself of the facts. The Automobile Blue Book's official car went over both routes late last fall, and it was on the official report of this trip that Motor Age consistently has stood up for the northern route across Utah, as the safe one.

Markers Not Only Necessity

Mr. Joy pertinently adds in his letter to Mr. Tyng that tacking Lincoln highway signs along a road does not make it a safe highway for travel, and adds: "The trouble with Salt Lake City is that it has complacently set back thinking that it was secure in the present route of the Lincoln highway, and that the mere name 'Lincoln highway' on a poor road leading to Salt Lake and south of the lake would suffice to bring tourist traffic and tourist business to its doors; here is where Salt Lake City was being fooled."

This was last July, and here is a condition from this same route last week, when Anita King, the movie star, making a transcontinental trip, left Reno, over the Lincoln highway, and was compelled to remain on the Fallon desert from 9 o'clock Saturday morning until 3 o'clock Sunday morning, where she was delayed by bad road conditions.

The Racer

By Kendall Harrison

I'm short an' stubby; my nose is grubby;
I smell most awful vile;
But I'm rather alive—I start with a dive
That carries me half a mile,
An' I fight the track while the posts slide
back
In a very encouragin' style.

You may be keen on your limousine
An' your French upholsterie—
My seats are tight as Saturday night;
That's how they've got to be—
My job is to run like a son of a gun,
An' there ain't no fat on me!

Talk of your class in paint an' brass,
Shined up like a new saloon—
My greasy hide ain't never been dyed,
An' it maybe won't be soon;
An' there's dents that's stood in the side
o' my hood
Since the Vanderbilt, last June.

But gimme the goad, an' the open road
Is mine, from stern to stem—
The skinny an' stout, they all pull out
When they hear me after them,
'Cause I pull my freight at a hundred
an' eight—
Three thousand r.p.m.

See America First — See America Now

EDITOR'S NOTE—This is the forty-third of a series of illustrations and thumb-nail sketches of scenic and historic wonders of America to be published in Motor Age for the purpose of calling attention of tourists to the picturesque points of interest in their own country.

No. 43—OLD MAN OF THE DALLES, MINNESOTA-WISCONSIN INTERSTATE PARK

FOR more than a century after the discovery of America nothing was known of the region about the headwaters of the Mississippi—in other words, Minnesota. This state is replete with many scenic and historic places of interest today, even if it did not begin to make history quite so early as its cousins in the original thirteen colonies. Here-with is given a view of Nature's handiwork as a sculptor, a masterpiece that was christened many years ago as, "The Old Man of the Dalles." Overlooking the St. Croix river in Interstate park, which lies within the borders of two states—Minnesota and Wisconsin, not far from St. Paul—this old sentinel, who has withstood the action of Nature's alchemy for more years than the ordinary individual is privileged to remember, watches the flow of waters down the tributary that goes to help the Mississippi what it is—North America's greatest river.



To Campaign Maxwells Prest-O-Lite Co. Purchases 4 Cars for Speedway Events

Rickenbacher Will Be Captain of Team at New York

INDIANAPOLIS, Ind., Sept. 14—The Prest-O-Lite Co., of Indianapolis, has entered the racing game. Carl G. Fisher and James Allison, officials of the company and two of the four owners of the Indianapolis speedway, have purchased the four Maxwell racing cars from the Maxwell company and they will be campaigned on the speedway circuit under the management of Eddie Rickenbacher.

Two of the four cars will be entered in the Sheephead Bay race of October 2. Rickenbacher will drive one of them and Harry Grant probably will be put at the wheel of the other.

The four cars were purchased for \$25,000. According to the terms of sale, the Maxwell company is to supply spare parts and make replacements resulting from damage in practice and contests while Ray Harroun is to tender expert engineering service to the new owners.

The Maxwells have been gathering dust in the Detroit plant of the maker since early in July when the Maxwell company retired from the racing game after finishing third in the 500-mile race at Chicago and winning the 300-mile contests at Omaha and Sioux City.

ABANDON SUNDAY RACE DATE

Chicago, Sept. 13—At a meeting of the directors of the Chicago speedway this evening, it was decided to abandon the plan of holding the autumn race on Sunday, October 17, and stage it on Saturday, October 16, as originally contemplated. The refusal of Ralph Mulford and Ralph de Palma to drive and Harry Stutz to make entries in a Sunday race led the promoters to reconsider their plan.

CORONA RACE ON CHRISTMAS

Corona, Cal., Sept. 11—There will be no Corona road race November 20 as previously announced. The event has been postponed and probably will be held on Christmas day.

The reason for the postponement was not only to avoid a conflict with the Phoenix track race, which is scheduled for November 20 for a \$5,000 purse, but the fact that the three main roads into Corona will be torn up for reconstruction within a few days and will not be completely rebuilt until after the date previously selected for the annual 300-mile race.

While the roads will be impassable for several weeks, it is claimed that when they are reconstructed they will be excellent boulevards and touring to Corona for a

Christmas day race will be a great pleasure. The postponement also will give the drivers a chance to compete in the 150-mile race at Phoenix and then return to southern California to prepare their cars for the fast Corona course.

NEW ORLEANS SPEEDWAY ASSURED

Chicago, Sept. 14—According to David F. Reid, president of the Chicago speedway association, New Orleans is assured a 2-mile board track as the result of a deal closed yesterday.

An option has been closed on 300 acres of land in Jefferson parish, midway between the Mississippi river and Lake Pontchartrain and 4 miles distant from the heart of the city. Transportation facilities are said to be ideal, seven steam and electric lines running to the site of the proposed speedway.

It is estimated that the plant will cost in the neighborhood of \$300,000. The low cost is possible because wood native to Louisiana will be used. The track will be built of cypress and the stands and other buildings of yellow pine.

The three men most interested in the project are R. B. Rennyson, prominently identified with New Orleans horse racing; George Sarpy, a New Orleans' insurance man, and C. J. Dunbar, a wealthy timber owner of Vancouver, B. C. They probably will finance the undertaking. They have asked Reid to take the presidency of the association and direct the construction of the plant.

It is the intention of the promoters to construct a 1-mile horse racing course inside the motor track and to stage motor and horse races at the speedway during the week of the Mardi Gras.

K. C. TRACK READY IN MAY

Kansas City, Mo., Sept. 13—Contracts now are being signed for the construction of the proposed speedway at Overland park, on the Strang electric interurban line near Kansas City. The Mid-Continent Exposition club, which was organized several months ago for the purpose of building clubhouses and exposition quarters at Overland, is confining its enterprise solely to the speedway for the present. The speedway will be ready by the last of May, 1916. William Huttig, president of the National Reserve bank; W. B. Strang, of the interurban line, and Frank Ufer, wealthy oil man, are the leaders in the project.

MERCER TAKES FOUR RACES

Wilmington, Del., Sept. 11—The four events staged on the dirt track here in connection with the Delaware state fair Friday, all were won by Roy Freck, who drove a Mercer. Other events were canceled owing to an accident to R. O. Bacon, whose Renault threw a tire and overturned in the 3-mile event.

Providence Big Field Saturday's 100-Mile Race At- tracts Twenty-One Entries

Eliminations Will Be Necessary on New Asphaltum Track

PROVIDENCE, R. I., Sept. 14—A talented field of cars and drivers will face Starter Frank Lowry here Saturday when the new 1-mile asphaltum speedway at Narragansett park will be dedicated with a 25-mile sprint and a 100-mile feature contest for prize money totaling \$10,000.

The entries for the 100-mile event is the largest that has ever been attracted to a century contest in this country, the field for the race being as follows:

Stutz, de Palma; Maxwell, Rickenbacher; Peugeot, Burman; Erwin Special, Erwin Bergdoll; Erwin Special, Grover Bergdoll; Mulford Special, Vail; Duesenberg, Haupt; Duesenberg, O'Donnell; Duesenberg, Henderson; Stutz, Dickinson; Ogren, Alley; Chevrolet, Jessop; Mercedes, Sartori; National, Connery; National, Myers; Stutz, Sorrell; Pugh Special, Lecain; Sunbeam, Grant; Bugatti, Basle; Peugeot, Jones, and Peugeot, Mulford.

It is a question whether Mulford will start. His Peugeot has not arrived from France as yet, although it has been due for the past 2 weeks.

As the A. A. A. rules permit only fourteen cars to start in a race on a 1-mile course, elimination trials will be necessary. These will be held tomorrow, Thursday and Friday and the fourteen drivers making the fastest time in the trials will qualify.

The Providence speedway is the first asphaltum course in this country, but it is regarded as exceptionally fast by the drivers who have tried it out. Railbirds look for a new 100-mile record to be hung up Saturday.

CALL OFF SUNDAY RACE

Minneapolis, Minn., Sept. 11—The 100-mile match race, scheduled for tomorrow at the Twin City speedway, has been called off by the promoters following a refusal of Ralph de Palma and Harry Stutz to enter cars in a Sunday contest.

According to J. F. Sperry, managing director of the speedway, the receipts from the 500-mile race of last Saturday were between \$115,000 and \$120,000 and there were about 31,000 paid admissions. Drivers were paid \$1,900 as their share of the practice receipts.

Sperry has completed arrangements for a \$350,000 mortgage which is to be floated to put the speedway project on a firm financial basis. The cost of the land and track was between \$800,000 and \$900,000 and \$400,000 in actual cash has been expended.

Alcohol for Motor Cars France Aims to Make Denaturized Spirit Fuel

Movement Is Part of Drastic Campaign Against Drink Evil

PARIS, Aug. 28—Denaturized alcohol will become a French government monopoly in 1917 and measures will be taken to extend the use of this fuel for motor car purposes. This movement is part of a drastic scheme for the reform of the liquor traffic. It is intended to raise the duty on alcohol from \$44 to \$100 per 22 gallons. In 1900 there was an increased duty of \$12.80 resulting in an immediate decrease of 88,000,000 gallons per annum in the annual human consumption of alcohol. Now that it is intended to increase the tax by \$56—practically $4\frac{1}{2}$ times the original tax—it is obvious that there will be a great drop in the amount of alcohol drank in France.

The question of state monopoly of the entire production of alcohol has been considered and abandoned in favor of the monopolization of denaturized alcohol only. A variety of interests must inevitably suffer by reason of the heavy taxation of alcohol, but by monopolizing denaturized alcohol, the vital interests of the industry and the nation will be safeguarded. In other words, the French nation which has drunk much alcohol and burned none will be made to drink less and burn much.

Alcohol in Army Tests

Exactly what machinery will be employed to effect this radical change is not yet known. It is obvious, however, that the first and most important step will be the fixing of a market price for denaturized and carburetted alcohol. Up to the present the supply has been so uncertain and the price subject to such variations that denaturized alcohol has not been a commercial product capable of competing with other hydrocarbons.

Nevertheless, the French always have taken an interest in alcohol as an alternative motor car fuel and the army authorities have insisted on every army truck being built to run on alcohol. This was done in the annual army truck competition when for one-third of the time the vehicles ran on gasoline, for a third on benzol, and for the remainder of the time on denaturized alcohol.

The same load and the same average speed had to be maintained on each fuel in these tests. No change of carburetor or compression was allowed, but the changing of jets and the making of adjustments was permitted. These competitions, which have been held for 6 or 7 years, have shown that alcohol is a suitable fuel for all internal combustion motors, but it is doubtful if there has ever been a gallon of gasoline used on the road outside of

these competitions. The object of the army authorities was to provide alternative fuels in case the supply of gasoline should be cut off by reason of war. Now that war has come, gasoline is the only fuel for military cars, benzol is monopolized for the making of explosives, and alcohol is ignored.

It has not yet been stated in what way the government intends to popularize the use of alcohol for driving motor cars. As there is no difficulty in getting an adequate supply of this fuel, the problem naturally resolves itself to one of price. It is thus safe to assume that denaturized alcohol, suitable for motor car consumption, will be put on the market at a considerably lower price than gasoline. The drop will have to be considerable to affect the ordinary motorist, for although benzol is a reliable substitute and costs appreciably less than gasoline, it has only been adopted by commercial firms using big fleets of trucks. The private motorist is somewhat prejudiced and does not consider the reduction in price sufficient compensation for the supposed inferiority of benzol. The same will apply in a greater degree to alcohol, which is an unknown fuel for 90 per cent of ordinary motorists.

Gasoline High in France

However, it will not be a difficult matter to put home-produced alcohol on the market at a lower rate than imported gasoline. The average retail price for this latter is now 52 cents per gallon. Prior to the war, the price varied between 46 and 48 cents per gallon. These rates are practically double those existing in England, to which country transportation rates are about the same as to France, and are due to the high import duty and local taxes on gasoline. It will be possible for the French government to sell alcohol for motoring use at nearly the same rates as gasoline in America and still secure a substantial revenue. This would cause an immense motor car development, for it cannot be denied that the high cost of fuel has had a restrictive influence on motoring, and particularly commercial motoring in France.

FORD BUYS TRACTOR PLANT SITE

Detroit, Mich., Sept. 14—There is an unconfirmed report afloat that Henry Ford has purchased a 200-acre tract near Libertyville, Ill., for a demonstrating ground for the Ford tractor and that later an assembly plant will be erected there when the building of tractors starts in Detroit.

CAILLE TO MAKE LIGHT SIX

Detroit, Mich., Sept. 15—Special telegram—The Caille Perfection Motor Co., which for the last 15 years has been making marine engines, will begin the manufacture of motor car engines within the next 30 days. The motor will be a light six-cylinder, as designed by Ralph Lewis, former chief engineer and general manager of the Beaver Motor Mfg. Co.

Chauffeurs Are Few Professional Drivers Becoming Obsolete in Illinois

Improvement in Cars Has Made Owner Independent of Pilot

BLOOMINGTON, Ill., Sept. 10—Passenger car chauffeurs rapidly are becoming obsolete in Illinois. Here in Bloomington, but five car owners employ chauffeurs. The remainder drive their own cars. Similar reports are heard from many other cities, following the visit of the state examiners in their tour of the state to examine and license the men who drive for hire. The examiners were surprised to find that so few chauffeurs held positions with owners of passenger cars. Ninety-five per cent are employed by taxi companies or are with owners of commercial trucks.

The rapid increase in the number of motor delivery wagons furnished positions for those who lost out when car owners decided that they would attend to their own driving. Men who sell cars say that the reason why so many men and women are driving their own cars is that there has been a marked increase in the number of six and eight-cylinder cars which with more flexible motors, make it easier to operate. The universal use of self-starters is another factor. The improvements in the motor car of 1915 are so pronounced as compared with the car of 5 or 10 years ago, that only the aged need pause when considering the question of driving today. Many car owners think that half of the pleasure of the trip, is in the driving.

Must Work About House

It also is asserted that the number of chauffeurs employed in driving passenger cars would be greatly reduced if they declined to assist in housework. Many, usually the colored drivers, hold their posts because they are willing to beat rugs and do other jobs that usually fall to the maids or butler. Most of the white chauffeurs refuse to participate in the housework and this display of self respect has cost many of them positions. Many of the deposed chauffeurs have found jobs as mechanics or floor men in the public garages, and are available in case of calls for livery service.

It is a peculiar development of the times that circumstances have forced the chauffeurs out of the seats of passenger cars. Despite the enormous increase in the number of cars in service, nearly every buyer now figures upon being his own driver or calling upon some member of his family. The professional driver appears to have passed beyond consideration of the modern car owner. It might develop that the increase in the number of accidents is traceable to the new order of things and the all but complete elimination of the trained chauffeur who seems to have outlived his usefulness.

Pan-American Road Congress Convenes at Oakland

Chief Forester of United States Tells Delegates How Government Is Opening National Forests to Motorists

OAKLAND, CAL., Sept. 11.—The Pan-American road congress, held under the joint auspices of the American Road Builders' Association and the American Highway Association, opened here today with Charles W. Gates, governor of Vermont, presiding and Governor Hiram M. Johnson, of California, Governor Ernest Lister, of Washington, and Governor James Withycombe in attendance. The convention will continue for 5 days, closing Friday evening.

Delegates from almost every state in the union are in attendance. The program consists of the daily sessions where papers pertinent to road construction and maintenance are read and visits to the Panama-Pacific exposition where the road-building machinery on exhibit there is inspected. Today's meeting was held in Festival hall within the exposition grounds.

One of the most interesting addresses made before the congress was that on "Road Building in the National Forests" in which Henry S. Graves, chief of the United States forestry bureau, told of the work the national government is doing in opening up the undeveloped portions of the west to motor tourists and providing thoroughfares to our national parks.

Forests Offer Road Problems

"There are 159 national forests in the United States with a net area of 136,000,000 acres," Chief Forester Graves said, "and because of their physical location, present serious problems in transportation and communication. They were not even provided with trails until the forest service took up their administration.

"Including the present fiscal year, \$926,000 has been appropriated, and \$526,000 has been expended for the construction, repair, and maintenance of some 500 miles of road. The remaining \$400,000 has been or will be allotted for use during the current year.

"Before proceeding with construction, the forest service made extensive reconnaissance surveys for the purpose of classifying the road projects in each state in the order of their relative importance. This procedure was necessary because the need and the demand for road construction funds has been many times the appropriations available. It has been the aim of the forest service to concentrate its funds on a few projects and to carry them rapidly to completion rather than to scatter its efforts over many projects with indifferent results. In the selection of projects for construction, preference is given to those sections and communities within or adjacent to national forests that are situated away from the main systems of state or county highways and that would remain without means of transportation

were it not for the assistance of the forest service.

"No attempt has been made, or is likely to be made in the future, to construct expensive surfaced roads. Transportation conditions within the national forests would not warrant the expenditure. It is the aim, however, to build good quality, medium-width earth roads with easy grades and adequate drainage. In several instances, on account of heavy rock excavation, it has been deemed advisable to build at present only a single track road, but with provision for frequent turnouts and so located that the width can be readily increased in the future.

"The funds available will build only a small part of the roads that are needed; the remainder must be built by the local communities or remain unbuilt unless some new plan for road financing is adopted. Under such conditions, the importance as object lessons of a few well-built and well-kept roads is apparent.

"There are at present twenty-four road projects under construction in twelve states. Among those already completed, several are worthy of special mention: The road over which for years all traffic was carried on between the Big Hole Basin, in Beaverhead county, Montana, and the Bitter Root valley, crossed the Continental Divide at an elevation of about 7,000 feet. On the Big Hole side the road was located for several miles up a swampy creek-bottom, completely submerged at high-water, and difficult of passage at all times. On the abrupt descent of the Bitter Root side the road dropped nearly 2,000 feet in a distance of 3 miles. In co-operation with Ravalli and Beaverhead counties and with local residents, the forest service made a complete relocation and constructed 26 miles of new road on firm ground, with a limiting grade of 6 per cent, at a cost of \$51,000—of which \$32,000 was paid by the Forest Service, \$13,000 by Ravalli and Beaverhead counties, and \$6,000 was raised by private subscription. This road gives to a large section of southwestern Montana access to the Bitter Root valley, forms a section of the National Park highway, is suitable for all forms of travel, and provides for through freighting without the necessity of breaking loads.

"Work has just been completed on the Troy-Libby road, in western Montana, forming the closing link in a through road down the Kootenai Canyon from the upper Flathead Valley to Spokane and the Inland Empire territory. A road now under construction in northern Idaho will complete through connections between Sandpoint, Idaho, and the international boundary. A road has been completed across the Ochoco National forest, in Oregon, forming

a connection between Prineville and the orchard country of the upper John Day valley; and another road under construction across McKenzie pass will become the main route from the upper Willamette valley across the Cascades into eastern Oregon.

Will Open Colorado to Tourists

"On the Idaho-Wyoming boundary a road is being built over the Teton pass to furnish an outlet from Jackson Hole and the upper Snake River valley to the railroad terminus at Victor, Idaho. The road across the Rabbit Ear Pass, on the Routt National forest in Colorado, will be completed this season. This road, together with one already built across the Cochetopa pass, will open up large sections of national forest in Colorado to freighting and to tourist travel. A road just finished on the Powell National forest, in Utah, will open communication with a settlement in a valley of the upper Colorado that has hitherto been practically shut off from the rest of the world.

"At the present time there is no road open the year through, or one suitable for freighting, between the northern California coast and that portion of the Sacramento valley north of Red Bluff. The available funds in California are to be concentrated in large part upon a section of road down the Trinity river, through the Trinity National forest, which will when completed furnish a through route, open at all seasons, with a grade not to exceed 6 per cent between Redding and Weaverville on the east to Humboldt bay on the Pacific coast."

COMPLETES LINCOLN WAY FILMS

Detroit, Mich., Sept. 11.—C. W. Thomas, the moving picture operator who made more than 14,000 feet of film on the recent official ocean-to-ocean tour of five cars over the Lincoln highway, returned to Detroit this week. Arrangements have been made to show this film to nearly 20,000,000 persons throughout the country, to educate the American motoring public as to what the United States has in the way of scenery, and to advertise the assurance with which the transcontinental trip can be made over the Lincoln way. The film includes many of the most notable features of the Panama-Pacific exposition.

FIGHTING MUDHOLE TRUST

Kansas City, Mo., Sept. 11.—The National Old Trails Road Association is aiding substantially in removing the pest of grafting farmers who capitalize mudholes. The association urges tourists to report offenses of this nature and immediately

seeks to secure the removal of the mudhole, or the disciplining of the farmer.

"One of our local associations, finding that the mudhole from which a farmer was making a large revenue, couldn't be improved by ditching, sent a man and team and hauled motorists through for nothing," said Judge J. M. Lowe, president of the association. "In many cases, our local associations send a man with a shovel to make a ditch, of course first trying to get the owner of the abutting land to repair the road. Gradually these annoyances are being done away with."

Roads now on the Old Trails route are in very good condition—judging chiefly by the lack of reports now coming in to the association's offices at Kansas City. Tourists are supplied with cards which they are asked to use for reports on road conditions, and when conditions are bad, the cards come in freely. The association also reports that very few complaints are coming in as to overcharges at garages and hotels.

COLORADO PARKS DEDICATED

Denver, Colo., Sept. 11—The past week has been marked by events of immense value toward bringing about a substantial increase in Colorado motor touring. The Mesa Verde National park, in the southwestern corner of the state, and the new Rocky Mountain National park, 100 miles northwest of Denver, have been visited by federal officials in charge of national park development, and formally dedicated. The ceremonies were attended by at least 1,500 motorists and nature-lovers, many of them from distant states.

NEW MAXWELL DIRECTOR

New York, Sept. 14—At a meeting of the directors of the Maxwell Motor Co., Detroit, held here today, John P. Jay, Jr., vice-president and general sales manager of the Pennsylvania Steel Co., Philadelphia, was elected a director and chairman of the board to succeed J. A. Vail, who resigned last week.

REO SIX \$1,250

In announcing the Reo last week the price of the six-cylinder model was given as \$1,150. This was a typographical error, the price being \$1,250. This model uses a motor, 3½ by 5½ inches.

MAKES MOTOR DRUNK

Hartford, Conn., Sept. 11—Five days in the county jail and a fine of \$5 was the sentence imposed by Judge Edward L. Steele in the local police court today on a man giving the name of Fred Christ of Springfield, N. Y. The case aroused considerable discussion since the man was charged with having operated a car while under the influence of liquor. The prosecuting attorney said the secretary of state had held that a man is under the influence of liquor when he has had one drink. The accused admitted that he had four beers.

Colorado Goes Dry; Garage Fee Results

*When Sunday comes to town,
The beer signs tumble down,
The city makes garages pay
And tanks that pump Red Crown,
They are taxed, they are taxed
For the license funds are low;
The thirst for rye's not hard to kill,
The motor dealer pays the bill
When Sunday comes to town.*

SIXTY or more public garages of Denver must pay a yearly license fee of \$25 into the municipal strong-box in order to meet the anticipated deficit resulting from the loss of saloon license money when state-wide prohibition goes into effect in Colorado the first of the year. An ordinance to this effect has passed the city council. There was no opposition from garage proprietors after the Denver Automobile Trade Association succeeded in having the amount of the fee reduced from \$50.

A companion measure, which is expected to pass, is a bill permitting garagemen to install curb pumps within certain districts by paying a license fee of \$25 annually for each pump.

Denver also is enforcing an ordinance that requires the payment of a yearly license fee of \$200 for the privilege of running a public gasoline-filling station. There was some talk of fighting this measure, but the belligerents suddenly lost their voice of protest and thirteen of the sixteen stations have paid.

Thus, those who cater to Denver's motoring trade are paying part of the cost of prohibition. By the way, these dry waves come high. In Chicago, where Billy Sunday has yet to cry, "Down with rum," it costs but \$25 to run a garage and operate a gasoline pump.

STRIKE CLOSES BEARING PLANT

Hartford, Conn., Sept. 15—Special telegram—The whole working force of the New Departure Mfg. Co., Bristol, Conn., 1,600 men, is on strike. In consequence there is renewed talk of the company removing to Detroit. Late Tuesday, the workmen began going out from the factory before the report of their committee in favor of accepting the company's offer was received. The demand of the men implies an increase of 30 per cent. The company is willing to make concessions to the extent of 15 per cent. The increase offered by the company means \$245,000 to the men. The development of this community is due largely to the efforts of this concern. Bristol is wearing a very sorry face this morning. The strike has a direct effect on all business in this place as the company at present is engaged in the fulfillment of numerous contracts and is seriously handicapped by the strike. In the event of failure of the men to come to terms, the obvious solution is establishment of the works elsewhere. Representatives of

the Willys-Overland Co. and the General Motors Co. left the factory late yesterday afternoon with full reports of the situation.

NEW PILOT SIX AND EIGHT

Richmond, Ind., Sept. 14—The Pilot Motor Car Co. heretofore confined to high-price high-powered cars has announced two new models at much lower prices for 1916. One of these is a six known as the six-45 to sell as five-passenger touring and four-passenger roadster at \$1,100. The other is an eight-cylinder, known as the eight-55, in two and five-passenger form at \$1,785. This gives four chassis for the 1916 Pilot line, the Six-75 at \$2,485 and \$2,400, the Six-55 at \$1,685 and the two new cars. New Pilot models are featured by double-cowl streamline bodies. The four-passenger roadster is even more unusual; it is called the Get-Chummy type by the maker. The front seats are individual with an opening between giving access to the rear seats which accommodate two people.

The Six-45 has an L-head 3 by 5 block motor, cantilever springs, and Delco electric system. The Eight-55 is of the conventional V type with 3 by 5½ cylinders and valves operated by a single camshaft, and 126 inch wheelbase.

In connection with the announcement of the new models, a change in selling methods also is announced. Heretofore the sales have been handled entirely by the Pilot Car Sales Co., a separate selling organization. This arrangement now has been discontinued and the cars will be marketed by the Pilot Motor Car Co. through branch houses and distributors. George E. Seidel, president and general manager, has assumed active management of the company's affairs. Joseph W. Connor, formerly district sales manager for the Leyman-Buick Co., Cincinnati, has been appointed sales manager.

MASON PLANT IS SOLD

Waterloo, Ia., Sept. 10—The plant and assets of the Mason Motor Co. were sold yesterday to the Black Hawk Improvement Co., a recently organized concern, for \$35,000, \$20,000 of which will be used to pay preferred claims on the Mason company. For some time past the company has been building and assembling cars for L. C. Erbes and the plant will continue in this work, producing machines bearing the L. C. E. trademark.

ARIZONA PLANS MOTOR RESERVE

Phoenix, Ariz., Sept. 10—Example of Los Angeles motorists in forming a motor reserve probably will be followed in a short time by Phoenix, Yuma, Prescott and other Arizona cities. The Mexican situation has made the citizens of Arizona more alive to the advantages of a motor reserve than they would be otherwise. The people of that state have been indignant for months because of the repeated inroads of Mexican raiders.

Ore and War Sell Motor Cars

Boom in Lead and Zinc Market Results in Creation of Many Prospects

KANSAS CITY, Mo., Sept. 14—Europe's great war and its direct influence on the lead and zinc market in America has brought motor cars into reach of the man in overalls, the barber who shaves you, or the waiter who brings your soup or drops the ice into your water glass, if he is fortunate enough to work in these ore-favored spots.

The lead and zinc district, comprising an important area in Kansas, Oklahoma, Arkansas and Missouri, has come into renewed prosperity in the last few weeks. For a time, in fact, for about 10 months after the war broke out, zinc ore was selling for three times what it formerly sold at and then came a sudden slump that sent the price down more than 50 per cent. A revival in price, however, has followed that has put the district into good humor again. Zinc blend sold last week at \$70 to \$86 a ton, where it had sold the week before at \$50 to \$70, and the market was still climbing.

Number of Cars Increase

Just how important the price of zinc ore is may be understood from the fact it is often said that every other man in southwest Missouri and southeast Kansas owns stock in a zinc mine. Also thousands of investors are represented in the western cities in the thousands of zinc mines in the Joplin district. And while many more investors are represented than appears in the half dozen counties where the mines are located, the effect on the motor industry may be gauged by the fact that Jasper county, Missouri, in the mining district, has shown an increase alone from 1,768 to 2,450 cars since the first of the year.

It means something when it is said that the Kansas-Missouri-Oklahoma-Arkansas lead and zinc district will produce \$25,000,000 of lead and zinc in ores alone. To get the comparison a little better, possibly, all the gold mined in the United States and Alaska in 1913 amounted to only \$88,000,000.

This is a condition that has come about only in the last year and one that will last a year at least and probably longer after the war is over. The cause is simple. Before the outbreak of the war, about one-half of the world's output came from Germany and Belgium. The war has shut down nearly every zinc mine in these countries. The trouble in Mexico has cut off production there and the Australian zinc ore can not be smelted in America at a profit, so that the world is dependent on America for zinc.

Now, while the war lessened by one-half the production of zinc, it vastly increased the demand for it, because brass is made of about 50 per cent of zinc and brass

enters into the making of almost every cartridge.

In 1914 the Joplin district produced 257,047 tons of zinc ore, valued at \$9,702,804, which is a little less than \$40 a ton. This year, with the increased activity, the output ought to be 300,000 tons, the experts say, and at \$75 a ton this would bring into the district \$22,500,000. This much zinc ore would make 150,000 tons of spelter, valued at \$45,000,000.

But zinc ore is not smelted in the Joplin district because of lack of fuel there. It is cheaper to carry the ore to the Kansas districts of cheap fuel than to carry fuel to the zinc districts, so the smelters are in the gas and coal fields.

Everywhere in the zinc fields around Webb City and Joplin are men who are becoming rich, men who a year ago had nothing and are making thousands of dollars a month now with prospects of that income keeping up as long as the war lasts and a year or 2 afterward, for even after the war ends, it will take a year or 2 to get the Belgian and German industry on its feet again. Nearly everybody in the Joplin district has some interest in a mine.

In Webb City and Joplin, the barber who shaves you may have an income of \$100 a week from his one-eighth or one-sixteenth interest in a zinc mine. The waiter who serves you may be getting from \$50 to \$100 a week from his mining interest, and the man in overalls over on the corner, who was a shoveler a year ago earning \$2.50 a day, may have an income now of several hundred or even a thousand dollars a week. There are lots of instances of that kind. You meet them everywhere.

Motor Car a Necessity

The mines of this district produce a grit that makes fine roads and radiating out of Joplin are 600 miles of grit roadway. These roads help to make the motor industry grow, too. The mines are located all over the district and some of them are 20 miles from a good-sized town, so that the motor car is not only a luxury, but a necessity. The light cars are most in demand, but the most expensive kind are seen on the street driven by the zinc and lead "Coal Oil" Johnnies.

A new territory that the motor trade is hearing from now and is to hear more from this fall is the panhandle of Texas. This empire, which formerly was given over to the open range and frequented by coyotes and prairie dogs, is being broken up into farms. The present season is the greatest in its history. Wheat is threshing an average of 25 bushels to the acre and forage crops are very luxuriant. It's the panhandle's greatest year since any

record of rainfall and crops has been kept.

Amarillo, the commercial center, with a population of about 13,000, has a licensed registry of more than 900 motor cars of all makes. Its newspapers are carrying expensive motor advertisements and the smaller towns are rapidly establishing motor agencies.

Of interest to the motor industry is a discovery reported by the mining bureaus in Springfield, Mo., in the Ozark mountains. What is said to be the first manganese discovered in Missouri has been uncovered in Christian county. It is believed that there are other rich deposits in these mountains. Manganese is used in hardening steel and has been in great demand since the war began.

JULY EXPORTS \$12,302,445

Washington, D. C., Sept. 14—The exports of motor cars, motor trucks and motor car parts was thirteen times as great during the month of July as it was during July a year ago, the heavy war orders in trucks being largely responsible for this increase. In July this year, 2,469 motor trucks were exported as compared with thirty-two a year ago. In the passenger car field the export business increased nearly five times over a year ago. In July, 1914, there were 840 passenger cars exported and in July, 1915, there were 4,118. Weighed in dollars and cents, the export figures for July, 1914, were not a million, being only \$947,147, whereas July, 1915, they were over \$12,000,000. Here are the figures:

	1915		1914
Cars	4,118	\$3,835,347	840
Trucks	2,469	6,803,007	32
Parts		1,663,997	...
Total ...		\$12,302,445	\$947,147

As compared with June, 1915, the business in July, 1915, was not so great, there being more than 500 more trucks shipped in June and 300 passenger cars.

JOIN ACCESSORY ASSOCIATION

New York, Sept. 11—The following concerns have become members of the Motor and Accessory Manufacturers, the national accessory organization: Eclipse Machine Co., Elmira, N. Y., Eclipse Bendix starting device and steering gears; the John O. Heinze Co., Springfield, O., electric starters and other electrical apparatus; the Oakes Co., Indianapolis, Ind., fans, horns, etc.; William Shakespeare, Jr., Co., Kalamazoo, Mich. carbureters; Penberthy Injector Co., Detroit, Mich., carbureters, reinstated to membership.

AUGUST SHIPMENTS ALMOST DOUBLED

New York, Sept. 13—Shipments of motor cars during the month of August were almost double that of the same month of 1914, according to the report presented by the traffic committee to the directors' meeting of the National Automobile Chamber of Commerce yesterday. The figures were 15,141 carloads for last month, as compared with 8,352 in August of last year.

It was decided to have the drawing for space for the New York and Chicago shows at the office in New York October 7, members of the N. A. C. C. drawing for space in the morning and non-members in the afternoon.

There were reports by committees on patents, good roads, standard treads and a uniform time for announcing new models.

As a result of the service managers' convention held at Detroit, it was decided to organize local service managers' associations in Detroit, Chicago and Cleveland, a section already having been organized by the makers in Indianapolis and vicinity.

MAY HAVE TO REFUND FINES

Chicago, Sept. 14—Since the Chicago Automobile Club has complained of the prosecution of its members who drive through Highland Park, one of the suburbs to the north of the city, and a lawyer has been engaged to give instant service to arrested motorists there on the charge of speeding, only three have been arrested in a week.

Another interesting phase of the crusade also has developed and Andy McComb, Highland Park's demon motorcycle cop, has found another boulder in his path of duty.

When Andy suffered defeat in the acquittal of Miss Ruth Newhouse, of Glencoe, last week, by a jury, there was loud acclaim by those constituting the citizens' committee which is opposing a too energetic arrest on charges of speeding. Since then the committee has been busy delving into the ancestry and nationality of McComb.

George Phillips, attorney for the speeders, received a letter stating that Andy is a Scotchman and never has been naturalized as an American. It has been suggested that the 147 persons who have been arrested by McComb since June 1 institute proceedings against Highland Park for false arrest, and to endeavor to recover the fines paid on the ground that McComb, not being a United States citizen, had no authority to make arrests.

HARTFORD GETS BEARING PLANT

Hartford, Conn., Sept. 10—Hartford is to have a new industry as a result of the decision reached by the Atkiesbolaget Svenska Kullagerfabriken of Gothenburg, Sweden, makers of ball bearings known to the trade as the S. K. F., to locate here. A new \$2,000,000 organization has been duly incorporated under the name of the S. K. F. Ball Bearing Co. Eight acres of ground have been purchased along the tracks of the New York, New Haven & Hartford railroad in proximity to the works of the Whitney Mfg. Co. Those interested in the project assert that when the concern gets under way, 300 men will be employed and that the force will be gradually increased.

Court Holds Retail Price-Fixing Legal

Decision Sets Precedent Which May Be Cited in Future Cases and Affect Retailers

CHICAGO, Sept. 14—Legalized retail price fixing by the patentee, brief mention of which was made in the last issue of Motor Age in reference to the decision of Judge Geiger, in the United States district court for the northern district of Illinois, in which he held that the patentee has that right, in certain instances, is of such importance as to warrant more complete details this week. The case was one brought by the American Graphophone Co., against the Boston Store for the sale by the latter of phonograph records at a lower price than that fixed by the complainant.

The complaint filed covered the situation thoroughly insofar as the various clauses of the patent gives the patentee the right to stipulate the price at which its product is to be sold to the consumer. The defendants filed no answer to the complaint, but made a motion to dismiss, which was denied by Judge Geiger, who issued an order to show cause within 10 days why injunction should not be granted.

There are certain phases to the case which hardly can be called parallel with other cases involving the fixing of retail prices by the patentee and the court has made it plain in the decision that the case is of importance only insofar as it presents the question, "Can a patentee, upon the sale of a patented article, by contract require of his immediate vendee the observance of price restrictions upon resale?"

Judge Geiger says that prior to the decision in *Bauer vs. O'Donnell*, which was a case involving the sale of Sanatogan, a foreign product wholesaled by a drug house in New York to the retail trade for resale at a stipulated price, the manufacturer endeavoring to force the retailer to maintain the price through a contract with the wholesaler—this question now raised upon the motion to dismiss would have received an affirmative answer on the authority of previous cases wherein similar issues were involved.

Decision Draws Definite Lines

The decision draws definite lines, through decisions in similar cases, under which the fixing of the retail price by the patentee is legal. The court has held that to make this action legal the patentee must deal direct with the retailer under a contract setting forth the price under which the commodity must be sold to the general public. The American Graphophone Co. has approximately 6,000 dealers throughout the United States with each of whom it has individual contracts, and this was a determining factor in the court's decision that the complainant in this case has the right to fix the retail price.

Judge Geiger's interpretation is that when the patentee sells he cannot there-

after impeach the fact of sale, nor the transfer of title of the article, by claiming that he had affixed a notice thereto which qualified the right of the seller, or purchaser on resale, to agree upon price, but the question in this case is, can a patentee, while in the act of exercising his monopolistic right of sale, lawfully bind his vendee to terms of resale to be respected by the latter.

The decision says, in drawing the line of distinction between this and previous cases, that it has been held that the patentee may sell or assign his right to sell and introduce a covenant for price restriction; that he may sell his right to manufacture and sell and introduce a covenant for price restriction, but that he cannot sell his own patented article and compel his vendee to observe a covenant for a resale price.

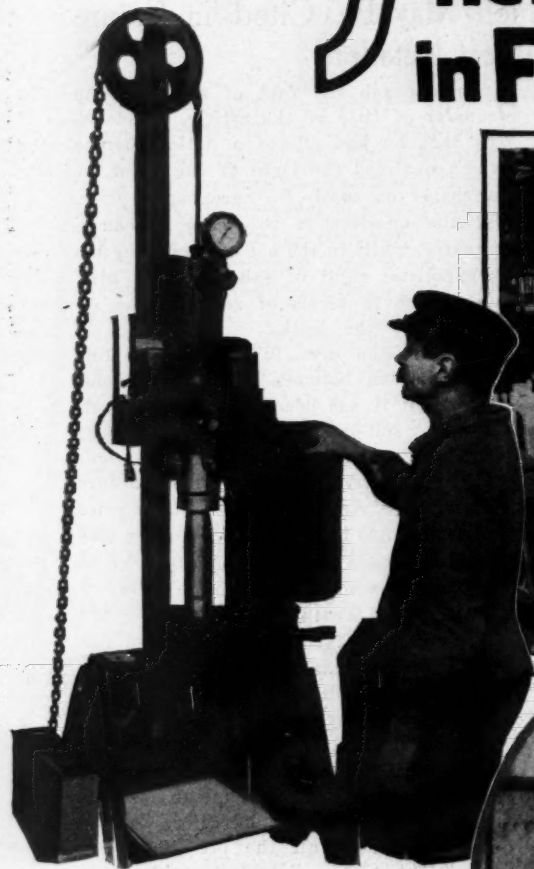
Lose Sight of Patentee's Right

It is shown that in this attempted distinction the fundamental notion of the patentee's right is lost sight of. The decision further says that the covenant for price restriction in other cases referred to, although found in a license to manufacture and sell, was germane to the patentee's exclusive right of sale. It was assumed that in all the previous cases such covenant was prima facie evidence of a violation of public policy, but that it was met and overcome by the fact that the public, through the grant of the patent, had given the article to be sold a status which enabled monopolistic bargaining, and that therefore rules respecting ordinary sales could not be applied. The court says that after the patentee has once allowed the patented article to pass out of the monopoly without committing, by proper agreement, the one to whom the article comes, to the observance of an obligation on his part, he cannot then recall it or claim that, by a notice, he burdened the article with such reservation.

Further that an agent or vendee of a patentee may, by direct covenant or agreement, be bound to the observance of price restriction, imposed as a condition upon which exclusive right of sale by the patentee is being exercised. Whether a violation of such agreement be dealt with as for infringement or breach of a contract inforceable in equity, is immaterial as between the patentee and his contractee, save only as it may affect the jurisdiction.

Lastly, the court says "that the complainant states a good cause of action against the defendant. If the contract is to be taken as the measure of the defendant's right, it seems to me that a failure to observe its explicit stipulation, constitutes infringement. Certainly the breach of the agreement, if valid, should entitle plaintiffs to relief in equity."

Shell Making in French Motor Factories



Testing shells to a pressure of
9 tons per square inch



Above—Examining and packing shells.
Left—Testing shells for expansion after
pressure test



NOT many of the motor car factories of England, France and Italy are producing motor cars at present. In France, the demand for cars ceased with the opening of the war. When the factories set to work again after the initial lapse of 2 or 3 weeks only a small percentage of them were able to produce the same goods as before. These were the firms specializing in trucks and aeroplane motors. The rest, and they comprised probably 75 per cent of the motor car industry of France, were given the task of producing shells, gun parts and other war materials.

All Factories Busy

There is not a machine shop in France at the moment which is not running at full capacity 20 to 24 hours per day. Where the men can be obtained, three shifts are employed on an 8-hour day each. In other cases two shifts are working 10 hours each, 6½ days a week. The half day lost on Sundays enables the men to change from day to night and from night to day, so that each shift works one week days the following week nights. The rapid and complete change from cars to war material was possible only in a country under com-

plete military control. In France motor car factory managers not only never dreamed of declining to work for the army, but would have been unable to decline army contracts if they had wished to do so.

Under England's freer system, no great enthusiasm was displayed at first for army contracts. There was an endeavor to carry on as usual, and as the shortage of cars began to make itself felt, car manufacturing firms had an increased desire to continue their ordinary production so as to be able to meet the demand when their rivals were unable to do so. Lately vigorous government action has had to be taken in order to meet the shortage of shells. English motor manufacturers, who for a long time had lived in the belief of a short war and had hoped to keep clear of army contracts, have been faced with the alternative of producing shells or closing.

Unlike France and Germany, England not yet is fully aware that the militarizing of the industrial resources of the country

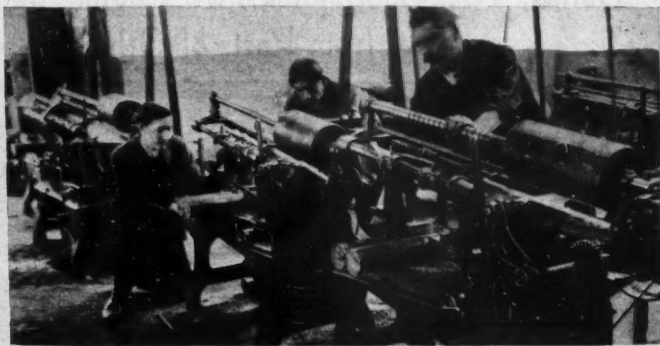
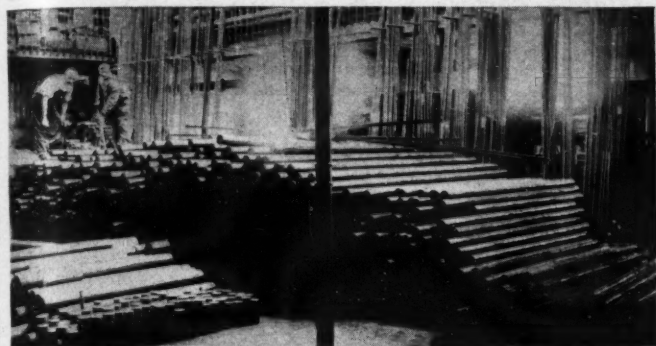
is of as much importance to the successful prosecution of the war as the drilling of the men to be placed in the line of battle. Among the various engineering establishments, the motor factories are very well equipped for the production of shells. It is obvious that some of the plant must remain idle, but there is probably more machinery in a motor car factory which can be used for purely war material than can be found in any other branch of engineering. Some changes have to be made in the arrangement of the plant, but there is no factory but can switch from cars to shells at a few hours' notice and most of them have been able to attain maximum output on the new class of work within a few weeks after accepting contracts.

Rigid Inspection

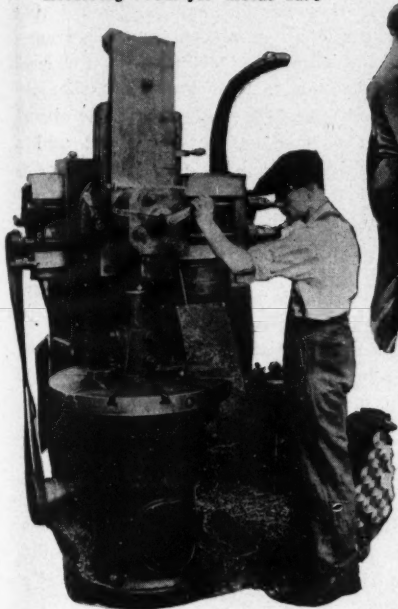
A very high standard of excellence is insisted on by the artillery officers of the allied armies charged with the task of inspecting the production of shells. The great task of France is the production of immense quantities of 75 mm. high explosive shells. It is not permitted to publish figures but some idea of the prodigious output of shells may be gathered from the fact that medium size motor car factories can turn out 1,500 to 2,000 shells every 24 hours, while keeping a part of the establishment for car work, and that every factory, big or small, and whether connected with the motor industry or not, is working at full pressure.

The steel bars from which shells are made are supplied to the factories by the government.

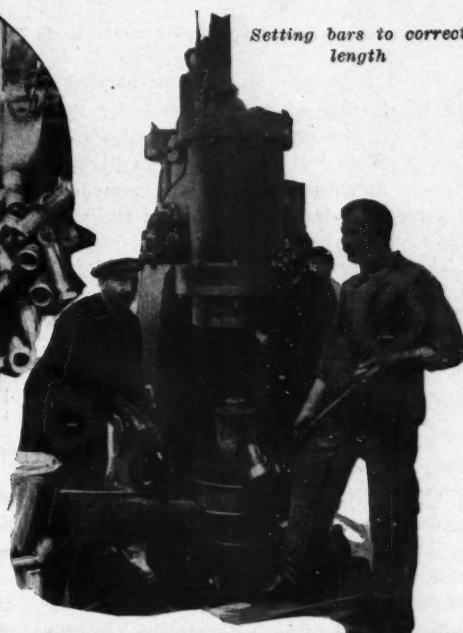
Some Intimate Views of the Munition Factories of France



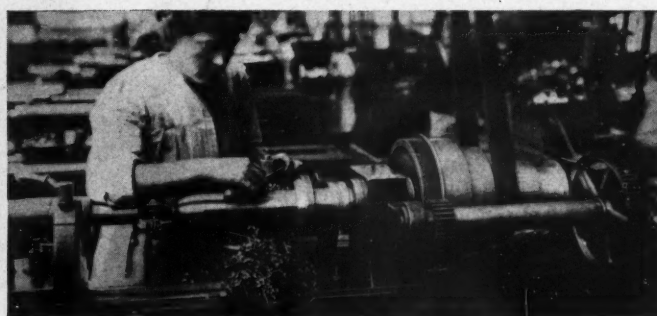
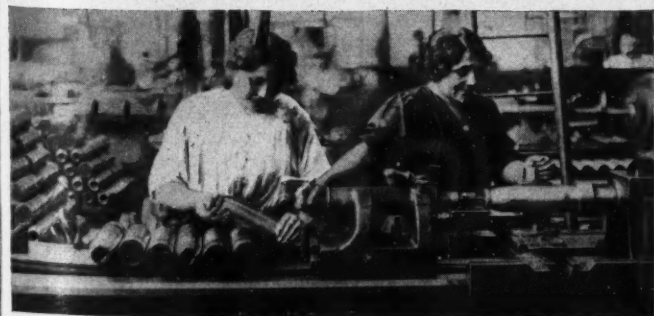
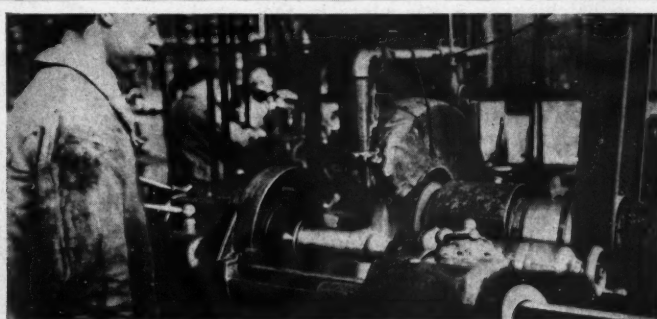
Receiving room for metal bars



Setting bars to correct length



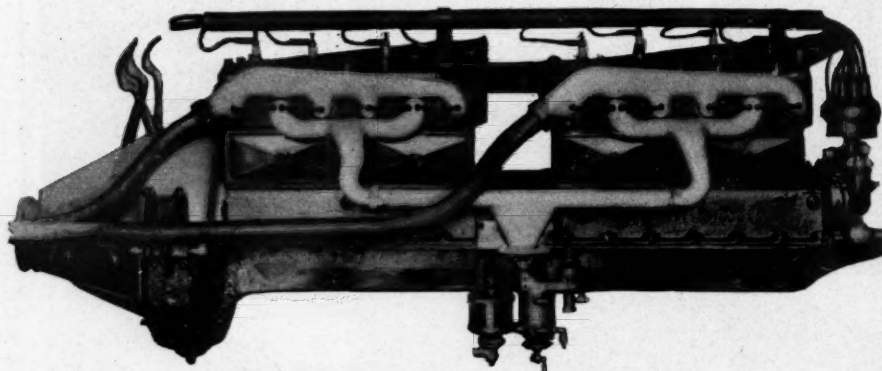
Above—Shells in heating process. Left—Trimming off the ends. Right—Forming end of shells under steam pressure



Upper left—The final cutting. Upper right—Finishing process in which Norton grinding machine is used. Lower left—Women turning copper band on base of shells. Lower right—Finishing copper band on shells

An Eight-Cylinder Ford Motor

Dallas, Tex., Shop Joins Two Engines and Makes Car from Parts of Others



Eight-cylinder motor made by joining two Ford engines

SOME time ago Motor Age carried a brief story of an eight-cylinder Ford made by joining two Ford engines together. This week it is able to give its readers an illustration of the remodeled motor and a description of how the work was accomplished.

The design is the product of Battle & Hubbard, Dallas, Tex., assisted by Chief Mechanic McElroy, head of the shop. The two crankshafts were connected in the center by means of a flange coupling, using the original flange on the front motor

shaft and shrinking another on the front end of the rear motor shaft, bolting the two together.

The crankcase was made by using the front and rear ends of the Ford crankcase and brazing in steel sides to give it the required length. The intake manifolds are of the original Ford type, the rear one being sawed in two, turned around and the two welded together.

The carbureter is a model 2-C Stromberg, double-jet type. The two exhaust lines run back into a single muffler, de-

signed especially for this motor. Atwater Kent ignition is used, regular Ford type, excepting the distributor head, which was built especially for this motor.

The chassis for the finished car was built by the Battle & Hubbard shops from parts of Krit and Ford cars.

MOTOR EAR NEWEST DISEASE

Boston, Mass., Sept. 10—Prize fighters are not the only type of sportsman that carry marks of their calling at either side of their heads.

The cauliflower ear, the result of repeated blows on the organ of hearing, has a rival in the motor ear, the discovery of Dr. D. Harold Walker, a physician of this city, who, in an article published in the current issue of the American Medical Association, states:

"Motoring has become so general that a 'motor ear' is a common occurrence. This condition is caused by the abnormal speed through the air and from the irritation of dust. The use of a little simple oil in the nose before going out and a plain saline wash after returning is good.

"It is true that we possess more hearing than we need in our present life. In colonial days, we depended on acute hearing to enable us to hunt the deer and discover the prowling Indians, but now all that seems necessary is to be able to hear the telephone bell and the satanic blast of the motor horn."

Boys Build Roads at Tubercular Camp—Reformatory Inmates Work on Highways

CINCINNATI, O., Sept. 13—Motorists who use the Wooster pike to and from the hundreds of camps that dot the Little Miami river near Cincinnati are very appreciative of the work done by the children of the Anti-Tuberculosis League camp in patching up a bad place in the road wrought by the August storms.

The pike, usually in good condition, was rendered almost impassable right in front of the camp at Bamford Hills. At one time five motor cars, whose owners had attempted to pass the bad spot, were lying in the ditch at the side of the road. The children, who are all tenement aenemics, got interested and under the direction of Frank O'Dropka undertook to mend the road. They carried tons of large rocks from the river bank in their small wagons, and in some places, built up the road 3 feet. It took them 2 weeks to perfect the job. They also completed a driveway that leads from the pike up to their camp. This driveway would have cost about \$200 to build, as it is all uphill work.

Later, when the Wooster pike was badly oiled and the motorists were afraid of skidding, Frank organized a sand brigade and kept a corps of boys busy sanding the roadway. Altogether, seventy-three children worked on the Wooster pike road patching.

Hartford, Conn., Sept. 13—Fifty boys from the state reformatory are building a

road between Milldale and the reformatory, and possibly will go on with the macadam in Cheshire.

The reformatory had a hard time getting the work started, as there was great opposition to it, but the board

was determined to make the attempt and results to date promise success. When work began it was expected to require 6 months, but it probably will be finished in four.

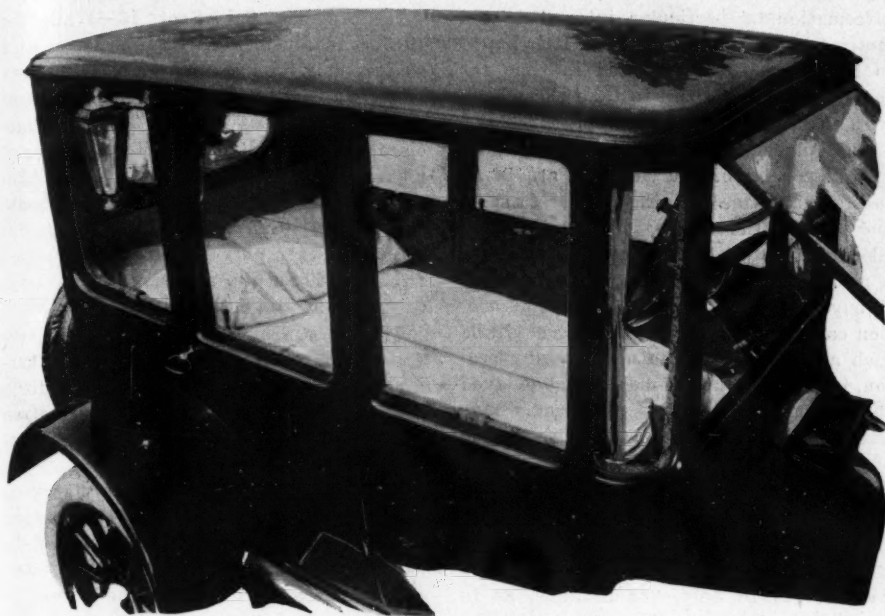
The boys have given their word not to attempt escape. Some few, of course, may not have sufficient intelligence to live up to the standards of the group, but most of the boys are putting backbone into the work and doing their part towards making it a signal success.



Boys of tubercular camp repairing road

Studebaker Sedan Equipped With Berths for Touring

New Yorker Has Car Specially Built for Making an Extensive Trip That Is to Take in Many Points on Continent

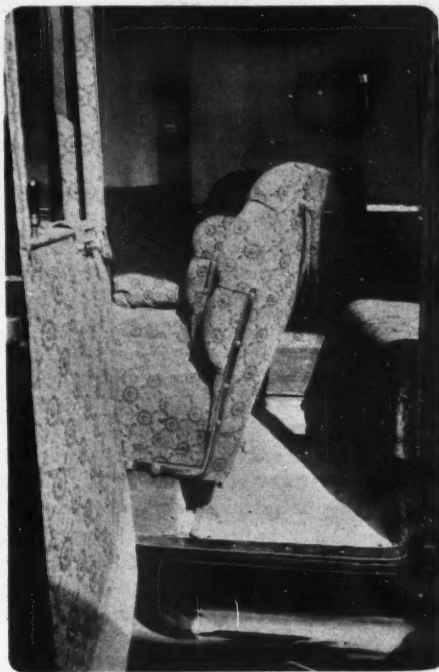


Studebaker equipped with berths for touring

NEW YORK, Sept. 13—Mr. and Mrs. Sproat, have started upon a tour that will extend over a period of 2 to 3 months and into the west. They are using a 1916 Studebaker sedan, specially designed for them, following out Mr. Sproat's expressed desires. The seats of the sedan are convertible into berths, said to be as comfortable as those of a Pullman. Also, the car is equipped, among other conveniences, with an ingeniously constructed, compact refrigerator, so that in every way the Sproats are relieved of any dependence

whatever upon hotels or inns. The nature of their itinerary makes this condition very desirable, since it gives assurance against any lost time, or pleasure, pushing forward or going back to obtain sleeping or eating accommodations.

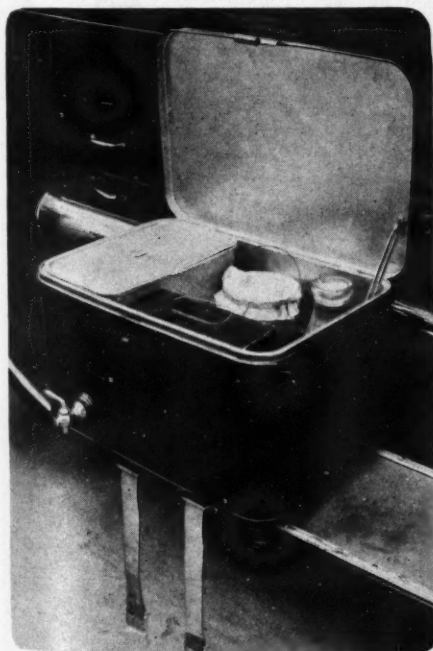
Mr. and Mrs. Sproat can go where they choose and stop where they please. The first leg of their journey led through Boston, Mass., the White mountains and the Adirondacks. From Oswego, N. Y., they go by boat to Toronto, motoring from there to Hamilton, Ont., New Lon-



Interior seat arrangement

don, Ont., and Detroit, Mich. From this point the Sproat's trip will lead into the west as far as the Pacific coast, taking in the largest of the intervening cities, Yellowstone and Glacier National parks.

Mr. Sproat has been for 16 years with the McCray Refrigerator Co. and this is his first vacation in 4 years. He plans also to visit the McCray factories at Kendallville, Ind.



Running board pantry

Tourists Need Warmer Clothing

Cold Wave Strikes Mountain Districts—Much Travel Toward the East

RENO, Nev., Sept. 13—The routing book of the Reno Commercial Club was consulted this week for data regarding tourist travel. It was done for two reasons. First, because the registrations at the garages appeared to have fallen off. Second, to see how the commercial club routed the many tourists that seek information there.

By this consultation it was found that the travel is not falling off, but is probably increasing, although the majority of travel is at this time east bound. It was also found that the commercial club is making a careful study of the roads in every section of the west in order to be able accurately to direct motorists. When the Lincoln highway party was in Reno several weeks ago, Secretary W. H. G.

Buck was made a consul. Naturally it helped to increase his enthusiasm for the Lincoln highway, but he is sending people over the Overland trail just the same, and where there is a stretch of good road just off from either of these two trails, he points it out to the motorist, explaining in just what way it is better than the main road. This action is doing much to popularize the club.

A move to shorten the highway between Reno and Carson City, eliminating many of the sharp and dangerous curves, was inaugurated last week, and it met with instantaneous response. While the burden will fall mainly upon the people of Washoe county, in which Reno is located, there is an enthusiasm for such a move that will probably mean a shortening of the road

between here and the state capital by several miles.

Two weeks ago Harry K. Thaw was said to have passed through Reno. It was some one apparently misrepresenting him, for it was only a week ago that he passed through and he did not hesitate to make his presence known. He was quiet, unassuming and took unusual precautions to secure the names and addresses of all those with whom he came in contact. He was driving his own Packard and was well tanned and dusty.

Movie Star at Reno

Anita King, star of the Paramount pictures, who is traveling to New York, carrying in her Kisselkar messages from Mayor Sebastian, of Los Angeles, and Mayor Rolph, of San Francisco, to Mayor Mitchell, of New York, spent a day here during the week. She made the trip from San Francisco in record time and had only one blowout. Miss King is traveling across the continent without any escort and is prepared to camp out all night, if necessary. If any bold, bad men get fresh, she carries a revolver and a shotgun—sawed off—for protection. In the principal towns she stops and appears at the motion picture theatres to tell about her trip and the pictures in which she has appeared and will appear.

Calls for printed information about

roads and road conditions have been so numerous lately that the commercial club has made an appropriation for the issuance of a thorough information book of Nevada roads and resorts. The pamphlet will contain three big maps showing every highway in the state and will contain information of particular interest to the motor tourist as to roads, etc. It is hoped to have the book completed in time for some of the easterners to take them back with them from the exposition.

The plans for a municipal camping ground for motor tourists still are being considered. One of the choicest spots looked at by the members of the city council cannot be used, as there is no way for a machine to get into it without passing through private property, and such permission cannot be secured. That there will be such a place before the next touring season, is assured, but the matter was delayed this summer because the councilmen wished to get a location as close to the business section of town as possible.

Figures on Travel

Some interesting figures have just come from Ely, where one garage reports 351 transcontinental parties registered in August, 329 in July, 224 in June, 82 in May, and 30 in April, a total for the season of 1,016 cars. This is from only one garage in Ely and there are several in

that city. They look for a larger registration in September and October, as these 2 months are the most pleasant for touring in the west.

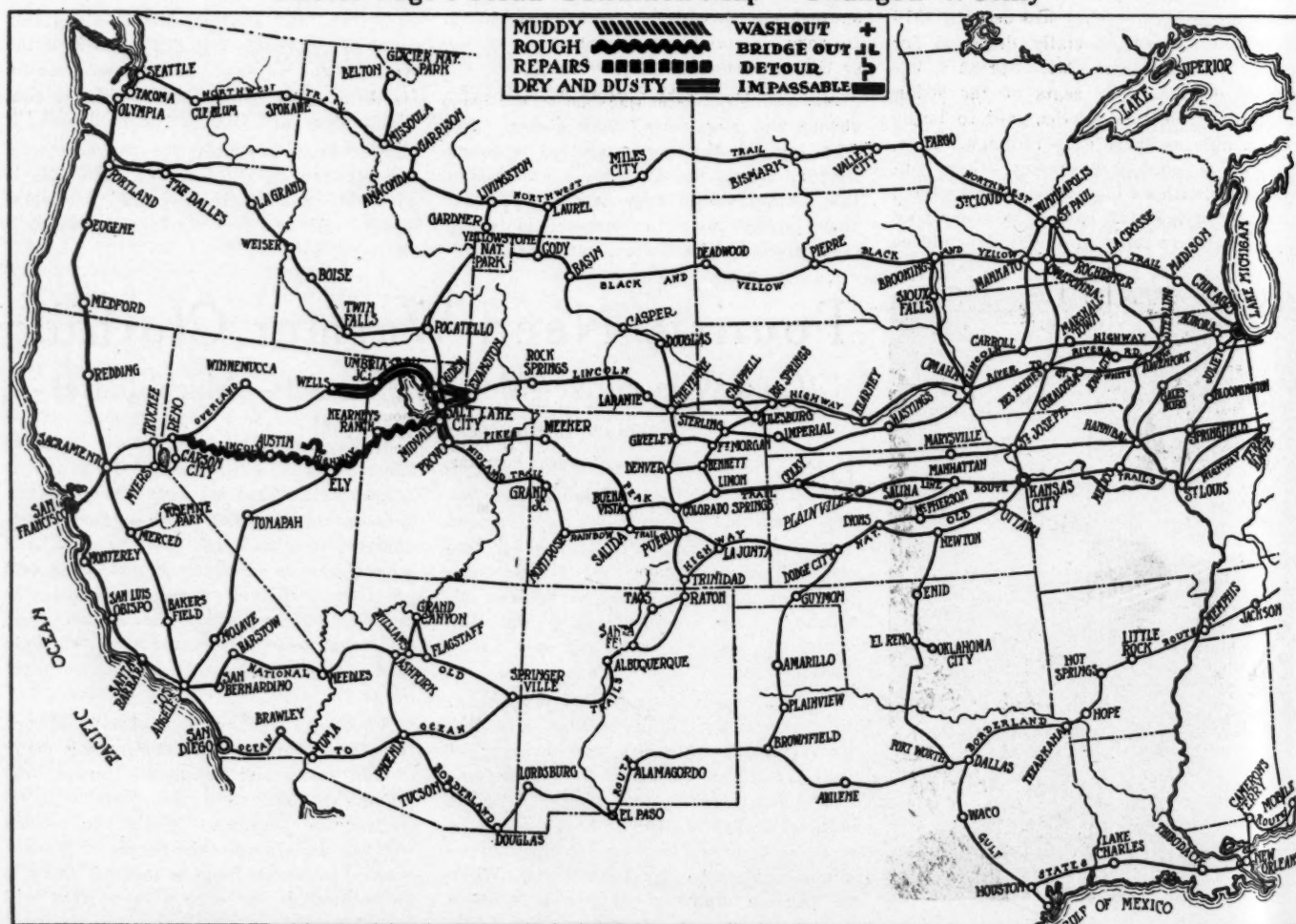
TOURING RECORDS SHATTERED

Los Angeles, Cal., Sept. 13—While the 1915 transcontinental records have been shattered beyond all expectations, eastern motorists now in California and prominent motor men in Los Angeles and San Francisco claim that many times the number of transcontinental parties will be in California next year than have or are making the trip this season. Almost without exception, each party returning to the east will tell of the trip and encourage friends to make the run next season.

Motorists from every section of the United States report that there are hundreds of owners waiting in the east for a report on the trip who will make the run across on one of the transcontinental highways next season.

Only the more daring in many sections have attempted the long trek this year and with thousands of motorists telling of the wonders of America and exhibiting interesting photographs made on the journey, it is predicted that the great touring year will be 1916, when increased thousands will be "Seeing America."

Motor Age's Road Condition Map—Changed Weekly



Straight Tips on Transcontinental Trails

Latest Reports on Road Conditions from Those Who Know



TELEGRAPH TIPS

BILLINGS, MONT., Sept. 13.—Special telegram—A cold wave has struck Montana and considerable rain is falling throughout the southern part of the state. Some snow in northern section, roads are fair but motor travel is light.—E. C. Wright.

Reno, Nev., Sept. 13.—Special telegram—Nevada's roads, according to tourists traveling both east and west, are in fair condition at this time. The roads east of Austin on the Lincoln highway, which were reported dusty and containing numerous chucks, are considerably better, due to the recent rain, which was heavier in the

eastern part of the state than in the western section. A light frost occurred Sunday night and the mornings are beginning to get colder. This is not an indication of an early winter in this section, but overcoats are not uncommon now and motor parties in the last 2 days report it quite cold camping out. It would appear that the touring season across this state is approaching its close, but fine, warm weather is generally the rule here during all of September and half of October.—Spellier Reinhart News Service.

ST. ANTHONY, IDA...... Sept. 11—Roads between St. Anthony and Yellowstone park are in very good condition. Recent rains have settled all the dust, but the portion between St. Anthony and Pocatello is not so good, as the dust is quite deep. There has been very little rain on this portion of the road this season.—William D. Yager.

BELLEVILLE, KAN...... Sept. 11.—Between St. Joseph and Belleville the reports of tourists are that the highway is in fine condition, with the exception of a few narrow strips of country where local showers make the road slightly muddy, Belleville to Colby road conditions are good. Belleville to Wichita tourists say the Meridian road is fine.—Miller & Schwab.

HANNIBAL, MO...... Sept. 11—The Pike's Peak highway between Hannibal and St. Joseph is in splendid condition. This is the report I have received from a number of tourists who have used the highway. Last Monday a party of five arrived in Hannibal, having driven from St. Joseph that day, a distance of 216 miles, and stopped in ten towns. They report the road in fine shape. From Hannibal to Kansas City there are two routes: one via Pike's Peak trail to Chillicothe and then through Excelsior Springs to Kansas City. The other is from Hannibal via Mexico and Columbia, thence over the St. Louis-Kansas City route. Either route is in good condition. Hannibal to St. Louis is a link of the Red Ball route, and is fine for travel. A small portion of the road near Frankford, which was damaged during a recent flood, has been improved. From Hannibal to Springfield a portion of the Pike's Peak trail is being used daily by motor tourists. The crossing of the Illinois River is safe and road conditions are very good. From Hannibal to Keokuk a portion of the Red Ball route has never been better. The paved road from Hannibal to Palmyra, a distance of 14 miles, has been oiled, and tourists will find it one of the best highways in this section.—H. A. Scheidker, Secretary Hannibal Commercial Club.

OMAHA, NEB...... Sept. 13—The Omaha-Lincoln-Denver highway is in good condition. Lincoln highway through Nebraska is again normal. All roads around Omaha are in good condition.—S. E. Smyth, Assistant Secretary, Omaha Automobile Club.

YUMA, ARIZ...... Sept. 11—Rains the last day or so have greatly benefited roads west of Yuma, especially between Yuma and Holtville. Not enough rain to cause wash-outs, but enough to help the sand greatly and lay the dust for some time. Between Phoenix and Yuma the road will be muddy for a couple of days and then will be much better than for several months. Yuma county has completed 5 miles of graded and surfaced road between Yuma and Dome, thus eliminating the bog holes that have in the past caused trouble in wet weather.—J. S. Mactavish, President, Ocean-to-Ocean Highway.

RENO, NEV...... Sept. 11—Motor car travelers will be perfectly safe in counting on crossing the Sierra Nevada mountains, between Reno and San Francisco, either by way of the Truckee or Placerville routes, through the months of September and October, and the roads will probably be open until about November 15. After these passes are blocked with snow, parties can be detoured around the Feather river route for several weeks later, at an increased mileage. From Reno west the routes into California are in good condition, with all chances of remaining so until the snow falls.—W. H. G. Buck, Secretary, Reno Commercial Club.

OGDEN, UTAH...... Sept. 11.—From Ogden by the way of Logan and McCammon to Pocatello, the road is good, with exception of spots where it is being rebuilt. However, these sections may be avoided by a small detour, so generally speaking the road is really good. The same applies to the road from Ogden to Pocatello by the way of Malad. While I have not been over the entire distance from Ogden to Granger this year, reports are that the road is reasonably good. There have been some storms in Wyoming, but this has tended to help the road rather than injure it. Tourists are making no complaint on this road. Due to a dry spell extending over 3 months, the road has been dusty and in places rather cut up between Ogden and Salt Lake City. This is also due to the fact that 5 miles of the distance is being built in concrete, necessitating a detour. Otherwise, road is good. The long dry spell has made the road from Ogden to Cobre very dusty and rutty. While the greater portion of it was entirely rebuilt last year, the lack of moisture has had a tendency to make it unfavorable, but the storms last week have settled these conditions to a big extent, and with the exception of possibly 10 miles in the entire distance, the road is favorable.—J. Samuel Larson, Secretary, Ogden Publicity Bureau.

DAVENPORT, IA...... Sept. 11—The best route at this time from Chicago to Davenport would be via DeKalb, Dixon and Sterling. The route through Ottawa, Princeton and Geneseo is good in dry weather. From Davenport to Des Moines the River-to-River road seems to be preferred, although the White Pole route is in excellent condition. Davenport to Quincy, the best road under all conditions is via Muscatine, Grand View, Burlington, Ft. Madison and Keokuk, crossing the river to Hamilton, and going straight south to Quincy. The best route from Davenport to Cedar Rapids is directly northwest via Maysville and Tipton. The all-season best route from Chicago to Omaha is the Chicago-Sterling-Davenport road, River-to-River road to Des Moines, White Pole to Omaha.—Louis G. DeArmand, Assistant Secretary, Davenport Auto Club.

RATON, N. M...... Sept. 11—Roads very good all the way from Raton to Amarillo, with the exception of a few rough places caused by recent rains, but all dry and solid. Road fine over Raton pass and good the entire distance to Pueblo. Road is fine to Trinidad and from Trinidad to LaJunta good, with the exception of a few washes. Roads very rough a short distance between Raton and Maxwell, but most of the way to Las Vegas is in fine condition.—A. R. Davis, Manager, Davis Garage.

Routes and Touring Information



Section of the Mission Ridge road just outside of Santa Barbara, Cal.

Mission Ridge Road One of the Tiniest Scenic Motor Tours

Three-Mile Highway, Named for Santa Barbara Mission, So Circuitous That Constant Change of Scenery Is Offered

IN the Mission Ridge road, Santa Barbara, Cal., boasts of having one of the tiniest scenic motor tours in the country, exactly 3 miles in length, so circuitous that no part of it is covered more than once.

This ridge takes its name from the Santa Barbara Mission, which is located at its west end and near where the road starts to rise and continues a little more than a mile to the east and beyond there it becomes part of the fashionable Montecito section. It lies midway between the valley in which Santa Barbara is located and the Santa Ynez range of mountains to the north. The ridge is separated from the mountains by another picturesque valley, in characteristics very different from that upon which the hand of civilization more strongly has been borne.

At the present time the road is a good earth one, sufficiently wide for passage of cars going in opposite directions.

After one leaves the mission and starts to climb near some of the old ruins which in early days were part of the historic institution, one has a glimpse of the stately home of Clarence A. Black, formerly of Detroit, but recently elected president of the Santa Barbara Chamber of Commerce.

By Paul Gyllstrom

This mansion is on an eminence and at this same point there is a superb view up Mission canyon. The road one observes below this home is the one the tourist will cover upon completing the tiny run.

In order to hew close to civilization the motorist will have to bear to the right here and pass the normal school and continue south at an elevation of 500 feet, with city, sea and distant channel islands serving for near and distant views. It is only a few minutes and one is at the brow of the ridge where every combination of scenery is spread before one. It is but seconds and all trace of the former view is left behind and only the rugged range

lies before one. The highest point of this range is 4,000 feet above sea-level.

One gradually drops down into the valley-like formation and then continues on about a mile when the road draws around the west brow of the ridge and there ahead one again sees the old mission, while the Black residence rises to the left. Again there is the combination of sea and mountains which seem to meet far away as one gazes westward over the Goleta valley—a scenic cleft in the mountains.

As a tiny run this surely has no equal on this continent and there is little wonder that the new name of this sloping height of land is becoming more popular because of the beauties it suggests—The Riviera of America.

Answers to Inquiries for Route Information

Mt. Morris, Ill.—Madison, Kan.

MT. MORRIS, Ill.—Editor Motor Age—Kindly outline the best route from Mt. Morris, Ill., to Madison, Kan. What book would be the best guide for such a trip?—N. A. Watts.

Volume 5 of the Blue Book would be the best guide for this trip, although if you possess a Volume 4 it would perhaps be better to use that for the short stretch be-

tween Oregon and Dixon, which is not given in Volume 5.

From Mt. Morris drive down to Oregon and there to Dixon. Volume 5 will now take you to within a few miles of your destination. Follow the Rock River valley to Davenport, Ia., through Dixon and Davenport; from Davenport follow the Great White way to Des Moines, then take the Inter-State trail through St. Joseph to Kan-

sas City and the Santa Fe trail to Emporia. Madison is just a short distance south of Emporia.

Detroit, Mich.-Dallas, Tex.

Detroit, Mich.—Editor Motor Age—Would like to know the shortest and best route from Detroit to Dallas, Tex.—L. L. Hook.

From Detroit drive to South Bend, Ind., via Wayne, Ypsilanti, Clinton, Somerset, Moscow, Coldwater, Kinderhook, Mich., Orland, Ind., Howe, Middlebury, Elkhart, Osceola, Mishawaka to South Bend, over fair-to-good roads to Coldwater; balance almost entirely good gravel. From South Bend to Valparaiso via New Carlisle, LaPorte, Westville to Valparaiso. From Valparaiso, Ind., to Joliet, Ill., over good stone and gravel, via Deep River, Schererville, Dyer, Ind., Frankfort, Ill., New Lenox to Joliet. From Joliet to Ottawa, Ill., stone or gravel road, via Minooka, Morris to Ottawa.

From Ottawa, Ill., to Davenport, Ia., via La Salle, Seatonville, Hollowayville, Princeton, Sheffield, Mineral, Anawan, Geneseo, East Moline, Moline, Ill., to Davenport, Ia. This is good gravel most of the way—a few stretches of sandy road beyond Mineral.

From Davenport to Ottumwa, Ia., over a good dirt road, via Blue Grass, Pleasant Prairie, Muscatine, Fredonia, Columbus Junction, Columbus City, Washington, Brighton, Pleasant Plain, Fairfield, Agency to Ottumwa. From Ottumwa, Ia., to Chillicothe, Mo., through Blakesburg, Moravia, Centerville, Seymour, Lineville, Ia., Mercer, Mo., Princeton, Tindall, Trenton, Farmersville to Chillicothe. Fair-to-good dirt all the way, with the exception of the stretch between Blakesburg and Centerville.

From Chillicothe to Kansas City, Mo.,

From Oklahoma City, Okla., to Denison, Tex.—fair dirt to Lexington, balance natural road kept up by dragging—via Norman, Noble, Lexington, Pauls Valley, Sulphur, Milburn, Durant, Colbert, Okla., to Denison, Tex. From Denison to Dallas, Tex.—good natural roads kept up by dragging—via Sherman, Howe, Anna, Melissa, Plano, Richardson to Dallas.

This is the shortest route. Running directions in Volume 4 and 5 of the Blue Book.

Chicago-San Francisco

Marengo, Ill.—Editor Motor Age—Where can I secure maps of the Lincoln highway. Am planning a trip from Chicago to San Francisco, returning by way of Yellowstone park. Would like an outline for such a trip.—E. J. McNeany.

Maps and other information concerning the Lincoln highway may be obtained from the Lincoln Highway Association, Dime Savings Bank building, Detroit, Mich. For this trip you will require Volume 5 of the Blue Book.

Allow us to suggest the following trip: Drive over to Rockford and so down to Clinton, Ia., by way of Dixon and Sterling. From Clinton follow the Lincoln highway through Cedar Rapids, Marshalltown and Denison to Omaha and thence via Lincoln, Hastings, McCook and Sterling to Denver. The following itinerary all the way to the Utah line takes you through the heart of the wonderful Colorado Rockies, and we do not believe you would care to miss this trip. We therefore suggest that you continue south from Denver to Colorado Springs. Here turn west over the Ute pass to Buena Vista and thence up over the Tennessee pass to Glenwood Springs.

If you have time to spare, we suggest a

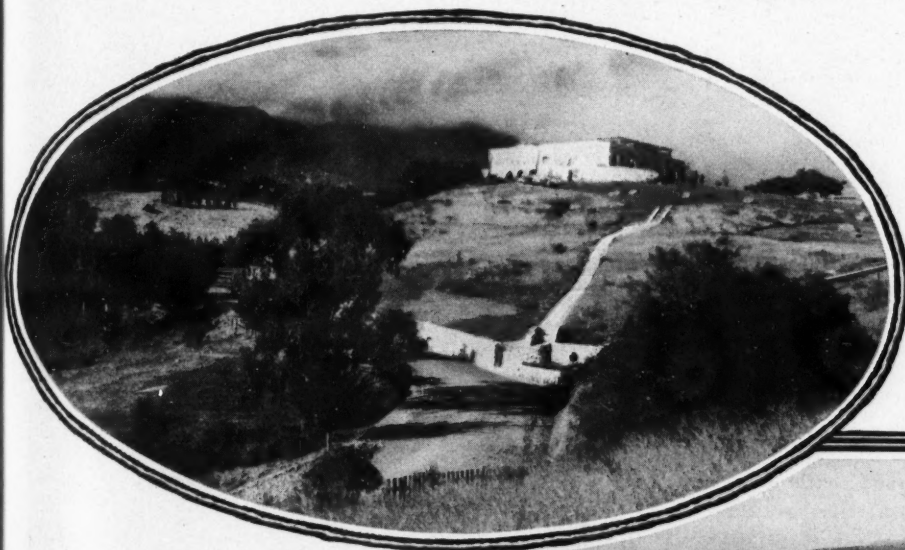
trip from Colorado Springs through the Cripple Creek country to Canon City and Salida; at the former place you can take the famous Skyline drive and the Royal Gorge trip. From Glenwood Springs follow the Pike's Peak-Ocean-to-Ocean highway through Meeker, Vernal, Duchesne and Heber to the Mormon capital, thence to Ogden. Here pick up the line of the Overland trail, going through Cobre, Elko and Winnemucca to Reno and thence via the south shore of Lake Tahoe to Sacramento and so on to the Golden Gate.

On your return trip, retrace your steps to the California capital and thence to the north of Lake Tahoe to Reno. From Reno follow the Overland trail through Lovelock. Winnemucca, Elko, Cobre, Montello and Snowville to a point between that place and Brigham. Here turn north for the Yellowstone park through Pocatello and St. Anthony. After touring the park, drive to Cody. From Cody, drive down through Basin, Thermopolis, Casper and Douglas to Cheyenne, and then east over the Lincoln highway through Julesburg, North Platte and Grand Island to Omaha. From Omaha follow the Great White way through Des Moines and Oskaloosa to Davenport, and so on to your destination.

Clarksburg, W. Va.-Wheeling, W. Va.

Weston, W. Va.—Editor Motor Age—Kindly give me the best route from Clarksburg, W. Va., to Wheeling, V. Va., mentioning the towns through which we would travel, distance and details as to present conditions of roads. Would Motor Age advise going by way of Washington, Pa., thence to Wheeling? What is the distance that way?—Subscriber.

The shortest route is through Fairmont, Mannington, Glovergap, Hundred, W. Va., Garrison, Pa., New Freeport, Rocklick, W. Va., Pleasant Valley, Limestone, thence to Wheeling, an approximate distance of 99 miles. The roads are fair-to-good dirt and clay (bad when wet) to Fairmont, then fine brick to Glovergap; balance dirt and clay roads, fair when dry but slippery when wet. This is a good trip in favorable weather. The route from Clarksburg to Wheeling via Washington, Pa., is approximately 130 miles. The road conditions from Clarksburg to Morgantown are fair-to-good dirt and clay, but bad when wet; Morgantown to Washington, Pa., fair-to-good dirt with some narrow stony stretches to Mt. Morris; macadam and pike balance of the way; Washington to Wheeling all macadam and brick.



Clarence Block home on Mission Ridge road

fair-to-good dirt roads over rolling country—via Utica, Ludlow, Plymouth, Brainer, Cowgill, Lawson, Excelsior Springs, Liberty to Kansas City. From Kansas City, Mo., to Emporia, Kan.—first 15 miles fine stone road, balance good dirt—via Overland Park, Kan., Lenexa, Olathe, Edgerton, Wellsville, Williamsburg, Waverly, to Emporia.

From Emporia to Arkansas City, Kan.—via Cottonwood Falls, Elmdale, Florence, Eldorado, Haverhill, Augusta, Douglas, Winfield to Arkansas City. From Arkansas City, Kan., to Oklahoma City, Okla., fair dirt roads, with occasional poor stretches—via Newkirk, Okla., Ponca City, Perry, Orlando, Mulhall, Guthrie, Edmond, Oklahoma City.



Bird's-eye view of Santa Barbara, Cal., from Mission Ridge road

Running directions will be found in Volume 3 of the Blue Book.

Monon, Ind.-Corinth, Miss.

Monon, Ind.—Editor Motor Age—Kindly give a route from Monon, Ind., to Corinth, Miss.—H. W. Long.

From Monon, drive to Remington, then 35 miles, over good gravel, passing through Wolcott, Montmorenci, to La Fayette.

Over a good gravel road proceed first to Indianapolis, Ind., 66 miles, driving through Dayton, Frankfort, Lebanon.

To Louisville, Ky., it is a trip of 124 miles, and is reached through Franklin, Taylorville, Columbus, Seymour, Uniontown, Crothersville, Scottsburg, Henryville, New Albany, Ind., Louisville. You will have a good gravel road as far as Uniontown; balance a mixture of dirt, gravel and worn-out road.

Continuing south from Louisville, route by way of Mt. Washington, Bardstown, New Haven, Buffalo, Magnolia, Bear Wallow, Cave City; from here Mammoth Cave is but a short distance; then on south from Cave City through Glasgow, Scottsville, Sugar Grove, Bransford, to Nashville, 100 miles.

At Nashville, local inquiry should be made as to the route through Brentwood, Columbia, Williamsville, Loretto, Tenn., Green Hill, Ala., St. Florian, Florence to Tusculumbia. Then west through Barton, Cherokee, Ala., Iuka, Miss., Burnsville, Corinth, Miss.

Detailed information given in Volumes 3 and 4 of the Blue Book.

Louisville, Ky.-San Francisco, Cal.

Louisville, Ky., Editor Motor Age—Kindly give me the best route and most direct route from here to San Francisco, and which Blue Book will be the best to buy.—Dr. J. B. Thompson.

For this trip you will need Volumes 4 and 5 of the Blue Book. The best and shortest route to the Golden Gate is first to Vincennes, avoiding French Lick Springs, and thence by way of Salem to St. Louis. Volume 5 will now take you to the Pacific coast, as follows:

Continue west from St. Louis to Kansas City via Columbia and Marshall, picking up the Santa Fe trail at Kansas City and following same through Emporia, Hutchinson, Dodge City and Syracuse to La Junta; here the Santa Fe trail bears southward for Trinidad and the southwest. New Mexico and Arizona are ideal for fall touring. On the other hand, the Rockies of Colorado are at their very best now. From La Junta turn north for Pueblo and Colorado Springs and so up through Denver to Laramie, on the line of the Lincoln highway, which follows west from Laramie to Salt Lake City via Rawlins, Rock Springs and Evanston.

If you want to see some wonderful mountain scenery, you might turn west at Colorado Springs over the Ute pass to Buena Vista and from there over the Tennessee pass to Glenwood Springs. Here you could pick up the Pike's Peak-Ocean-to-Ocean highway and follow same through Meeker, Vernal, Duchesne and Heber to the Mormon capital.

This is just a trifle shorter, and while prettier, leaves much to be desired as to road surface after crossing the line into Utah, where the so-called Utah desert is crossed. From Salt Lake City it is better to follow the north route or Overland trail to Reno rather than the south route or Lincoln highway. Each is far from being an ideal connection; still the Overland trail has none of the outstanding disadvantages under which the Lincoln highway labors.

The north route takes you up to Ogden and then by way of Snowville, Montello, Elko, Winnemucca and Lovelock to Reno. From Reno take the route to the south

of Lake Tahoe to Sacramento and so direct into San Francisco.

If following the Lincoln highway, it will not be necessary for you to go down to Salt Lake before striking Ogden, as the Evanston-Ogden connection can be made direct; we have assumed, however, that you would desire to visit the Utah capital.

Iowa to the Coast

Greenfield, Ia.—Editor Motor Age—Kindly advise which is the best road to the Pacific coast and the least steep, the Lincoln highway or the Santa Fe trail.—Guy A. Lee.

The best road to the Pacific depends entirely upon the time this trip is to be taken. The Santa Fe trail may be taken at almost any time of the year, excepting the summer months, when the southwest is generally so hot as to detract materially from what would otherwise be a most enjoyable trip. The Lincoln highway, on the other hand, is at its very best during the hot months. As to road surface, there is no great difference, there being a number of poor stretches on each of these highways. There is also no great difference as to grades, and you should base your choice of a route entirely upon the time this trip is to be undertaken.

Colorado Springs, Colo.-Phoenix, Ariz.

Estes Park, Colo.—Editor Motor Age—Please advise me as to the best route from Colorado Springs, Colo., to Phoenix, Ariz., the trip to be made the latter part of October. Any information from you as to condition of roads, length of day's run, hotel accommodations, extra equipment, if any, etc., will be appreciated.—C. D. Gordon.

An easy 1-day trip from Colorado Springs would take you to Trinidad, a distance of 137 miles. A fine hard road leads to Pueblo, 44 miles, through Kelker Station, Fountain and Buttes. Leaving Pueblo, you will find mostly macadam to Walsenburg, 53 miles, through Abbey and Greenhorn, with fair dirt road the remaining 40 miles through Lester, Rouse, Brick Diamond and Aguilar to Trinidad.

Stopping over at Trinidad for the night, a good second-day run would be to Las Vegas, N. M.—137 miles. This is a part of the National Old Trails route, which you will follow as far as Springerville, Ariz., and is sign-posted. Considerable work has been done on this route in preparation for heavy transcontinental traffic this season. You should route through Starkville, Morley Station over Raton pass, which offers a winding but well-graded road, with wonderful views of snow-capped peaks to west and north, thence through Raton, Maxwell, French, Springer, Colmar, Wagon Mound to Las Vegas. Supply stations will be found at convenient intervals.

The third day's drive, an easy 137 miles, would take you to Albuquerque. Good time can be made practically at all seasons of the year over this road, which takes you through Bernal, San Jose, Pajarita, Rowe, Pecos, Glorieta, Canonicito, Santa Fe, over La Bajada hill, 19 miles from Santa Fe—long wheelbase cars cannot make all the

winding turns on this hill without backing—then on through Domingo to Albuquerque.

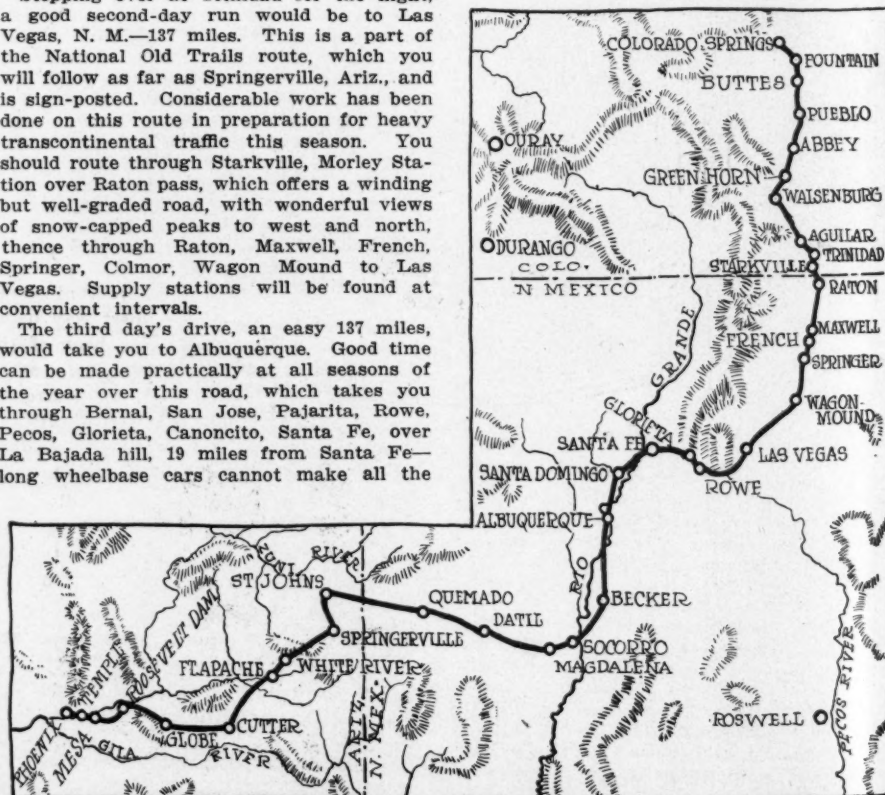
Since the road to Springerville is east, probably you can make a little longer trip on your fourth day and cover the 240 miles between Springerville and Albuquerque. The road is signposted all the way and you should have no difficulty as to directions. Drive through Old Hubbell Ranch, Becker, Kirkpatrick Spring, Socorro, Blue Canon to Magdalena, 109 miles, then over good graded road through Datil, Quemando, Largo Canon, to Springerville, 132 miles.

It probably will be best to divide the remainder of your trip, which is over the Ocean-to-Ocean highway, into 2 days, making Globe your first objective point, 146 miles distant from Springerville. This road is made of cinders practically all the way and is an easy 1-day trip, parts of which are through the largest forest reserve in the country. The only possible accommodations to be had on the way are by courtesy of the White Mountain Indian Reservation, and possibly at Fort Apache. This road runs through the Apache Indian Reservation, Cooley's Ranch, Black Canyon, White River Indian School, Becker and Rice.

The last leg of your Colorado Springs to Phoenix run will be over an excellent graded road, built by the government, as far as Mesa, 95 miles, the balance of the way well graded road through irrigated country, 15 miles. You probably will wish to stop over at Roosevelt Dam for a short time. This is 36 miles west of Globe. Picking up your route again, drive through Fish Creek, Mesa, Temp to Phoenix.

Nothing in the way of extra equipment is necessary as the day's run in each instance has been made short and hotel accommodations are fairly good at all the night controls mentioned.

Full running directions will be found in Volume 5 of the Blue Book. This can be had from the Automobile Blue Book Publishing Co., 910 South Michigan avenue, Chicago. Price, \$2.50.



Route map Colorado Springs-Phoenix, Ariz.



The Motor Car Repair Shop



Some Tips for Motorists on Care of Cars

Handy Valve Lifter

SOMETIMES it is very hard to lift out the valves after they have been disconnected from their springs. The stems can be shoved up as far as the guides, but this very often is not enough to get them above the cylinder opening so that they can be grasped and lifted out. A kink which is employed by many repairers is to take two pieces of old hack saw blade and bend them out slightly at one end. Then placing them flat against one another, they can be slipped down into the opening, and into the slot at the valve center, as shown by Fig. 2. On squeezing the upper ends together, a good grip is gained on the valve and it may readily be removed to a height sufficient to allow a good hold on it. These improvised grips may also be very handily employed to get at other light pieces in close quarters. There is nothing more annoying than to be able to touch a thing with the tips of the fingers and still not be able to get a grip on it.

Fasten the Dry Cells Down

In a car which utilizes dry cells for ignition purposes either in an emergency or normally, it is not a good idea to place them loosely in their appointed space. Most cars having them are fitted with some form of holding device to prevent their shifting and bumping together. Short circuiting of the wires, rubbing off of the paper containers so that the zinc sides are in contact, and damage through other similar causes are the results of carelessness in this matter.

If the car is not regularly supplied with some form of holder, it is best to take a piece of wood, bore holes large enough to receive the cells, and fasten this to the corner of the seat compartment or other space where the cells are carried. It does not take much time to do this, and it is a noteworthy precautionary measure.

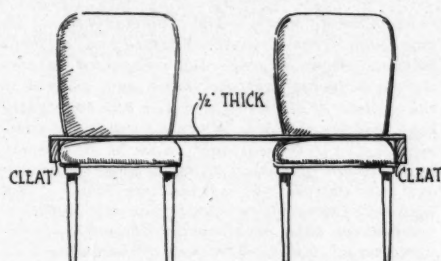
License Tags and the Radiator

It almost seems sometimes that the state authorities are bent upon making the license tags as big as bill boards so that even the nearsighted policemen will have no trouble in identifying them from a distance. The plates used in Illinois and New York are good examples of healthy sized licenses.

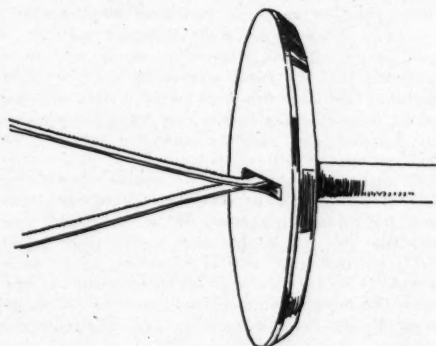
It was probably due to thoughtlessness or ignorance that a Ford driver put one of the big New York sign boards on the radiator of his car. The machine was noticed the other day with the plate wired flatly against the cooling fins. This had the effect of shutting off at least a quarter of the cooling surface of the radiator, and probably the driver wonders why he

overheats his engine so much. Examination of the radiator filler cap showed a large quantity of rust indicating the boiling over of the cooling water. It is no wonder, for the system is handicapped.

It is well to remember that the radiator needs all of its cooling ability in the



SEAT FOR EXTRA PASSENGER
By placing a board across the auxiliary seats in a seven-passenger car one more person may be accommodated



HANDY VALVE LIFTER
Device aids in raising part after it has become disconnected from its spring

summer time, and that placing plates over a section of the core simply renders that part affected useless. If possible, the license plate should be put on the axle. Leather straps can be used very nicely to hold the plate snugly, the best way being to run a section of the strap back of the plate and between it and the axle, so as to prevent rattling. The mudguard or some of its supports often can be utilized as attaching points for the license number. Many cars have a special bracket clamping around the radiator filler cap, and this is not so bad because the cooling air has a chance to get back of the tag and pass through the core of the radiator.

For the Odd Passenger

Sometimes the owner of a seven-passenger car would like to carry an extra passenger in comfort, and while the practice is not recommended as an every day thing, the use of a board bridging the two auxiliary seats serves admirably to give seating space for one more.

Take a piece of board about 1/2-inch

thick and as wide as the seat depth. Nail cleats on the bottom ends of this piece so that it will fit over the seats in good shape, and a substantial arrangement is provided. It is advisable to put some cushions on the board, so that riding will not be too hard for those who use this improvised three-passenger seat.

It is certainly not good practice to overload a car this way continually, but on occasion such added seating facilities are appreciated, and while no driver would care to haul such a board around when not needed, it is a handy thing to have in the garage for emergency use. Fig. 1 shows the scheme.

Shifting Tires

There is no doubt but what the life of a given set of tires can be materially lengthened by shifting them from time to time. The set on the right side of the car gets more wear than the left, generally speaking, and if this is noticeable in your case, it might be a good idea to change them around after a few thousand miles. Then too, the rear tires get more wear than the front, and these should also be changed about when the difference in the wear becomes noticeable. The rear tires carry more than half the load. They also do the driving and generally get the roughest usage. In a recent tire mileage contest, the winning users almost unanimously said that their showings were due to some extent to this judicious shifting from front to rear, and not overlooking the two sides, when it proved that those on one side received more wear than the opposite ones.

Keep Spring Clips Tight

There is one important thing in connection with the springs which the car owner should remember. That is to keep the spring clips tight. There is perhaps no one thing which can promote breakage of spring leaves quicker than looseness of these clips which keep the leaves in alignment and hold them snugly against one another so that each bears its proportionate share of the load and there is no undue strain on any leaf.

After a car has seen service for a reasonable time, there is a slight tendency for these clips to loosen because the leaves settle to smoother surfaces against one another, making the spring as a whole very slightly more compact. But this few thousandths of shrinkage, as it might be termed, is enough to have an effect upon the snugness of the clips, and they should be set tightly again by drawing up on the clip bolts until the clips show no tendency to move.



The Readers' Clearing House



COVENTRY, Eng.—Editor Motor Age—It is gratifying to note that the important point of tire wastage is receiving some attention, but it would appear to be generally supposed that the under-tiring of cars is the cause of nearly all the trouble, with which I do not agree. This is a subject to which I have given considerable attention during the past few years and by following a certain procedure I have obtained extremely good results even from a fast car which was by no means overtired. This was a two-seater with an 18-horsepower engine and it once lapped Brooklands cement speedway at 61 miles an hour. It is not suggested that this is any very high speed but the car at the time was fitted with a more or less conventional body, wind screen, and mudguards.

Using this car with 32 by 4 tires I could always obtain, with luck, 10,000 miles out of each cover. The previous car also fitted with a two-seater body but nothing like so fast, required a new casing every 2,000 miles. This car was fitted with tires well up to its requirements, showing that there was something outside the tires themselves which was responsible for the trouble.

In the first place one may ask what the average user does to obtain good tire results, and the answer is, nothing. He simply fits a new tire now and again, runs it until it bursts, and then blames the tire manufacturer, which is surely not fair. Before getting on to the more important point which I wish to raise I would like to mention that the user can do a great deal to obtain better results.

If he only realizes that a cut in the rubber is the first stage towards a blow out, he will take care to plug up the cuts and vulcanize them. He must also understand that the tire on the spare wheel is exposed to the deleterious sun rays and also to moisture, and is slowly rotting away without performing any useful service. The spare tires should be wrapped up and the spare wheel ought always to be enclosed in an envelope in order to protect

Lengthening Tire Life Wheel Misalignment Causes Premature Decline of Casings English Reader Cites Experience In Increasing Mileage

EDITOR'S NOTE—The communication on this page from Eric W. Walford, an eminent English patent attorney and recognized authority on motoring matters shows how general is the neglect of tires. Motor Age has constantly kept the tire problem before its readers recommending that the surface cracks be filled with some cement or rubber filling to keep the water out and stop rotting of the tire fabric. Mr. Walford recommends this; but in addition touches on that great white plague of pneumatic tires, namely, the lack of parallelism of the four road wheels. If wheels are not properly aligned tires will wear. There is no room for argument. Mr. Walford shows how in his car the parallelism of the front wheels depends on no fewer than eight different bearings, four on one side and four on the other, so that although all eight bearings may be in perfect adjustment when the car is new it is possible for the road wheels to get far from parallel as the bearings wear. One of the eight bearings can throw the front wheels out of parallel and cause undue tire wear. The danger of the rear axle getting out of parallel due to springs flattening or radius rods being out of adjustment is also pointed to as a reason for undue tire wear. If a car owner can increase the life of his tire casing from 2,000 to 10,000 miles by careful attention to all such points it would be worth while turning the car into the repair shop every 2 months to ascertain if all four wheels are in alignment.—Editor.

All readers of Motor Age are invited to write on the troubles they have had with tires, due to lack of alignment of the four wheels, stating what the lack of alignment was due to, how it was corrected and what results followed the correction so far as tire wear was concerned.

it from deterioration through coming into contact with the elements. However, few persons take this precaution to save their spare tires.

How many users ever reverse the direction of rotation of their tires? Or, in the case of the front wheels which lean outwards at the top, change them round so that both edges of the cover do an equal amount of work? With many of the simple bolt-type of detachable wheels one can remove the wheel and refit it with the original outer side next to the car. This reverses the stresses on the casing and lengthens the life of the cover. How many people anticipate punctures or take any steps until they are compelled? A puncturing article is often carried a hundred miles before it does any damage, and therefore if one will merely run one's hand round the wheels one can frequently pull out a nail before it does any damage.

It ought to be impressed on the motorist that he should take a little trouble with his tires. The majority of the wear on tires is due to slip either in consequence of the wheels leaving the ground or due to their not running perfectly straight with the consequence that there is a certain amount of drags as well as roll. My main point is that with modern design each wheel of the car tends naturally to drag in course of time even though all the wheels are set perfectly when the car is new.

Taking first the front wheels, these are kept parallel through the medium of no less than eight bearings. If they are set parallel when the car is new there will be no drag, but as in course of time these eight bearings, some of which are never lubricated, wear slightly, the wheels will spread at the front and the front tires will drag and the casings will wear out.

The same applies to a very small extent to the back wheels, but the back wheels are prone to drag from a different cause which also applies to a small extent to front wheels.

The axles are held square with the line of motion either by radius rods or by the springs. In the majority of cases the springs are used and this is always the practice with the front wheels. Now, the

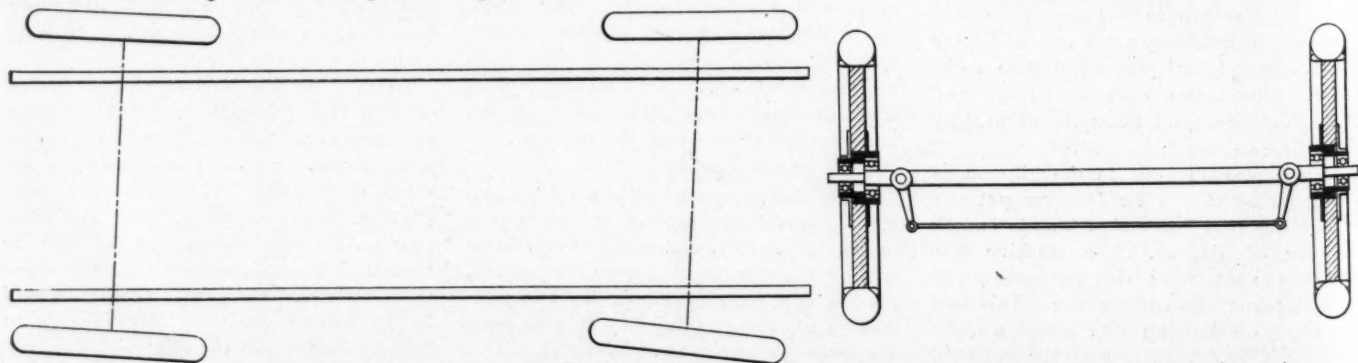


Fig. 1—Misalignment of wheels which comes with worn bearings and is cause of short tire life

right hand side of most cars is heavier than the left. It takes the re-action of the engine. It, at any rate in Europe, carries the steering gear, change speed and brake levers, spare wheel, and always the driver. Sometimes there is also a passenger on the right-hand side and none on the left. The result is that the right hand springs flatten out and the right hand ends of the axles are pushed further back. The wheels are no longer parallel to the line of motion and there results drag and tire wear.

There ought always to be an adjustable coupling in the link connecting together the two steering arms so that after a test for parallelism of the front wheels a correction can be made, and the car should always be loaded equally if possible. Sometimes one sees a covered car leaning considerably to the right. Not only does this look ugly but it means that the tires are being worn out.

From Fig. 2 it will be seen that the front wheels can only remain parallel as long as the four front wheel bearings, two steering pivots, and two steering joints possess no shake. Parallelism therefore depends upon the tightness of eight bearings.

Fig. 1 shows how, in the course of time, the two axles naturally come out of square with the line of motion, and the front wheels spread in front. This causes drag of the tires and unnecessary wear.—Eric W. Walford.

FORD MAGNETO AND GENERATOR Instruments Not of Same Type and Characteristics Differ—Wiring

Malad City, Ida.—Editor Motor Age—Why does not a generator on a Ford car burn out when the engine is running on dry cells, and why does a generator on a lighting and starting system burn out the coils and windings when the wires that take the current to the storage battery are taken off and the generator is run for some time?

2—What is the trouble with a generator when the armature shaft will rotate when the batteries are attached, and will not generate when driven at any speed?

3—Why are the brushes not insulated on the Auto-Lite generator? I had to repair a generator that would not generate at any speed. I tested the coils separately and they had a good pull, the brushes were good and the armature turned down.

4—Kindly illustrate the Gray & Davis light-

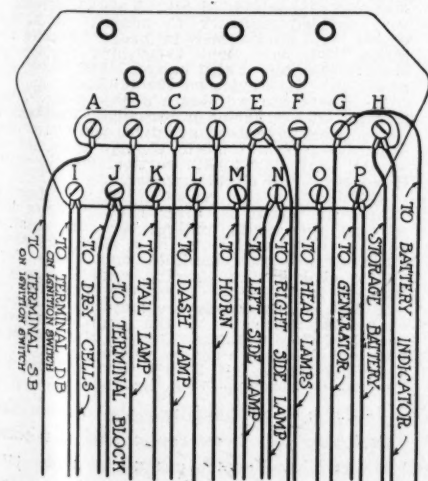


Fig. 3—Wiring of control switch of 1914 Studebaker four

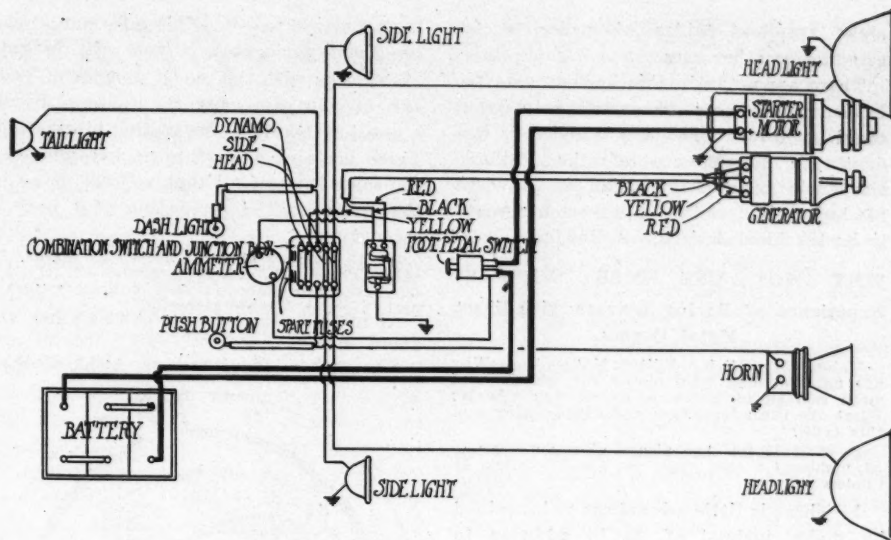


Fig. 4—Gray & Davis electric system on model 79 T Overland

ing and starting system used on the 1914 Overland model 79 T.

5—Illustrate the switch on a 1914 Studebaker, four-cylinder, showing the wires that go to the switch.—C. W. Lundy.

1—Without going into the theory of the electric units mentioned by you, suffice it to say that the Ford flywheel generator is not comparable in any way with the generators which are used on other cars for lighting and storage battery charging. They work on entirely different principles. The Ford flywheel unit is essentially a low-tension magneto, producing a primary alternating current. This is done by the permanent magnets on the flywheel passing the stationary coils, setting up a current in the latter by induction. The excess of this current lights the lights. Just as in any magneto, no harm can come to the unit by running it on an open circuit. As the Ford magneto produces alternating current, it could not be used for charging a storage battery.

On the other hand, the generator, as used in other cars, employs electro-magnets, instead of permanent magnets, and produces a direct current, which is suitable for battery charging. In the shunt-wound type of generator as usually found on motor cars the main body of the current passes through the armature and brushes, while a small proportion goes through the field windings, energizing the field. It will be evident that the higher the speed, and consequently the higher the voltage generated at the brushes, the larger the quantity of current taken by the field coils. The result is to further strengthen the magnetization of the field, which consequently raises the voltage. Soon the voltage, should the generator be run on an open circuit, will rise to such a height that the windings will burn out unless there is some protective device, such as a fuse, to burn out before the windings.

Summing it up, the Ford magneto cannot be compared with the motor car generator any more than can the magneto of any car be compared with its generator. In the Ford, as in any magneto, the field

strength does not vary, no matter how fast the engine is run.

2—Either the windings are damaged, the brushes are not making proper contact with the commutator, or the automatic switch is not acting properly. If the brushes get stuck in the holders, they may not bear on the commutator. Possibly the springs back of them are weak. If they prove to be stuck, carefully file them until they move easily in the holders without being too loose. It might be that grease, oil or dirt has collected on the commutator so that there is no contact even when the brushes work properly. The automatic switch should cut in as soon as the speed of the generator is sufficient to cause it to produce current of charging voltage.

3—Your question is not clear. The brush holders are entirely insulated from the generator case, or should be. If any of the insulating plates, bushings or washers are defective, they must be replaced. Probably the generator you mention had been tampered with and the insulation removed, which is the reason you had to repair the generator.

4—The Gray & Davis lighting and starting system, as used on the model 79 T Overland, is shown in Fig. 4.

5—Fig. 3 shows the wiring running to the 1914 Studebaker four switch.

WINDSHIELD IDEA FOR WINDOWS Reader Suggests Rain-Vision Ventilating Panes for Side Glasswork

Oklahoma City, Okla.—Editor Motor Age—Would it not be a convenience to have the sidelights on a sedan or convertible body made after order of the usual front windshields, clear vision, divided glass, upper glass hinged and the top and lower glass at the bottom. The desirable features should be the upper glass could be turned up outward for ventilation or the shedding of rain or upward inside for ventilation and well up against the top out of the way. The lower glass could be turned down either out or in and would

make excellent tables when desired for camping or other uses.

There are many in this locality who are having their cars converted into what could be termed "sleepers," and it is evident the convenience of the Pullman sleeper is desired, the sedan or convertible body with coming improvements seems to be the ideal desired.—A Reader.

WHY NOT USE DISK WHEELS? Experience of Racing Drivers with Sheet Metal Covers

Union City, Mich.—Editor Motor Age—Why are not the disk type motor car wheels used more instead of the wire or wooden wheels? What are the advantages and disadvantages of this type?

2—Will Motor Age please give some names of makers of this type of wheel?—Allen H. Cooley.

1—There is little advantage to be gained by disks, instead of, or in addition to spokes. Two or three years ago, racing drivers tried covering their wheels with metal disks to reduce wind resistance, but found that this affected the steering to too great a degree.

2—Motor Age knows of no one making such wheels regularly in this country. Any sheet metal works can make the disk covers for your wheels.

LOWERING CHALMERS 30 STEERING Job Requires That Frame Be Drilled— Anti-Freeze Formula

Austin, Tex.—Editor Motor Age—How may the steering gear in a 1912 Chalmers 30 touring car be lowered? Would it be possible to use the original gear? The box containing the gear, which is fastened to the steering arm, is bolted to subframe and the job appears troublesome. Might I hear from some reader who has done this particular work?

2—Where may I obtain winged filler caps with corresponding sections fitting onto the tank, similar to those used on the Stutz and National open roadsters?

3—Has the 1912 Chalmers, with one-piece pressed steel rear axle, Timken bearings? What make and form?

4—Is the clutch on this car lubricated from oil in the crankcase, or does it require separate lubricant? If so, what kind?

5—Give a good anti-freeze formula, and please state what point in temperature this would cease to be effective?—C. B.

1—You can make use of the original gear all right, but will have to drill different holes in the subframe to take the bolts attaching the gear housing to the frame. This is on account of the different angle. Any mechanic can do this, most easily, with an electric drill, although a breast drill can undoubtedly be employed if the other is not available. If you are unable to make the box adjust itself to the angle you wish, then the Chalmers company at Detroit can provide you with another box that will answer.

2—You might write any of the following, who make the business of supplying miscellaneous parts: Puritan Machine Co., Detroit; M. & M. Co., Cleveland; U. S. Auto Supply Co., Detroit; Automobile Specialty Co., Detroit; Auto Parts Co., 737 W. Jackson boulevard, Chicago; Times Square Auto Co., Chicago.

3—This axle was fitted with Timken bearings only as special equipment. Several makes of bearings were used as standard, the Standard roller bearing be-

ing usually supplied. This information can be given you exact if you will provide Motor Age with the model number of your car, or you can write the factory direct.

4—It requires separate lubrication. Three pints of a mixture of kerosene and the same kind of oil that you are using in the motor, in the proportion of 1 to 1 is recommended.

At 15 degrees above: 4 gallons water, 1/4 gallon alcohol, 1/2 gallon glycerine.

At 8 degrees above: 3 3/4 gallons water, 5 pints alcohol, 5 pints glycerine.

At 10 degrees below: 3 1/2 gallons water, 1 1/4 gallons alcohol, 2 1/2 quarts glycerine.

Use either denatured or wood alcohol.

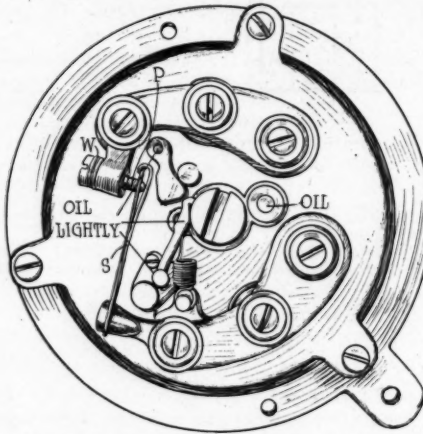


Fig. 5—Atwater Kent timer on Grant six

The above formulas are for an average four-cylinder cooling system. Where the capacity is greater, mix an additional amount in like proportions.

ATWATER KENT UNIT ADJUSTMENT Too-Rich Mixture Cause of Missing and Low Power in Grant Six

Ratliff, Tex.—Editor Motor Age—What causes my Grant six to miss on retarded spark, and when I advance the spark it hits all right for a time and then misses, until the spark is retarded again. It does not develop the power it should on high, and the cylinders seem to fill with carbon quickly.

2—Also state how to make adjustments on the bearing of the gearbox of a 1915 model T Grant six, and the kind of bearings used in same.—W. B. Faris.

1—This trouble may be in the timing of the Atwater Kent distributor, or it may be due to the contact points in the breaker not being properly set. To test the timing, retard the spark as far as possible by means of the button on the dash. Then take the wire off the first or No. 1 spark plug. Hold the terminal about 1/8 inch away from the plug or the cylinder casting, and notice whether a spark jumps at the instant that the mark on the flywheel "No. 1 and No. 6 T-C" passes the pointer on the engine. If no spark jumps, the timing is out.

The Atwater Kent timer is shown in Fig. 5. For proper service, the points indicated should be oiled once in every 500 miles, care being taken not to get any on the contact points P. The contact screw is provided with several washers W, against which it is tightly set. When the points become worn after considerable service, they should be flattened carefully and then enough of the washers removed so that

when the screw is set tight the point on its end will almost touch that on the spring S. There must be a little clearance between them, however.

2—The front end of the Grant gearbox uses roller bearings, while ball bearings are at the rear of the shafts. There is no way to make adjustments of these bearings. If they are worn, they must be replaced. It is improbable that your bearings are at fault in so new a car, and perhaps the universal is loose, causing a rattle. The gears might be burred by poor shifting, causing a noise. The best way to determine what is wrong is to make a thorough examination after removing the lubricant and the top plate on the gearbox.

BUICKS AND MARQUETTE-BUICK Latter Originated from Old Welch-Detroit —Featured in Races

Cedar Rapids, Ia.—Editor Motor Age—What was the difference between the regular Buick cars and the Marquette Buicks? Was this a separate factory, and was the engine different type?

2—Why were the Marquette Buicks referred to as faster cars?—A. C. Fisher.

1—The Marquette-Buick originated from the old Welch-Detroit. When this car was moved to Saginaw, Mich., to be manufactured, the name was changed to the Marquette-Buick, and then the regular Buick type of motor was used. In other words, the original Welch-Detroit engine was different from the Buick engine, but the Marquette-Buick used the Buick type. It was made in a separate factory from the Buick of today, which is manufactured at Flint, Mich.

2—The original Marquette-Buicks were racing cars. Like many other concerns, this factory sought public favor through racing channels, and its name first became known through the feats of these cars in races. It is probably for this reason that Marquette-Buicks were referred to as faster cars than the regular Buick stock models.

DISK CLUTCH DOES NOT RELEASE Thinner Oil or Mixture with Kerosene Should Have Good Effect

Mart, Tex.—Editor Motor Age—We have a model E Maxwell touring car using a multiple-disk clutch running in oil. This clutch has a very decided tendency to hang, that is, the plates will not release in order to shift the gears. We have done everything possible to obviate this, but it still hangs. Will Motor Age please give its advice on the subject?

2—Where can we obtain a good second-hand 2 or 2 1/4-inch Schebler or Stromberg carburetor?

3—Please give us what advice you can on the Ward-Leonard automatic electric system used on the 1912 Cole 30-40, particularly the selective switch and circuit-breaker.

4—What is the reason that a carburetor "loads up," that is, after running down hill without the engine pulling the car, or after running along real slow for a time, the whole carburetor, intake manifold and all is thoroughly choked with gasoline, sometimes standing out in beads all along the inside of the manifold. This causes the motor to choke up on a sudden advance of the throttle after the period of slow running. Cutting the gas down does not do, as the engine will not pull. It is a DeLuxe motor, 5 1/2 by 5 1/2 with a 2-inch Air Friction carburetor.—V. A. Bradley.

1—In all probability, the oil in the clutch has not been replenished for some time and has become gummy or thick, preventing proper release of the plates. Or, you may be using too heavy a grade of

oil, with similar effects. Wash out the clutch thoroughly with kerosene, and then put in a mixture half kerosene and half a medium grade of cylinder oil. This makes a light lubricant which should work satisfactorily. The clutch should be cleaned out with kerosene about every 1,000 miles and new oil put in, as above. If, after thoroughly treating the clutch in this manner, it continues to grab, take it apart and discover where it is holding.

2—Any general supply dealer should be able to supply these carbureters. Consult the Clearing House pages in the advertising section of Motor Age.

3—No electric equipment was furnished as standard on the 1912 30-40 Cole, hence Motor Age is unable to advise you until you state the type, model and other identifying features of the Ward-Leonard system to which you refer.

4—If adjustment of the carburetor alone will not remedy this trouble, it seems due to condensation in the manifold. This can be remedied by using a higher grade of fuel, but preferably by heating the manifold. A hot-air or hot-water jacket around it would prevent this condensation.

GEAR RATIO OF PACKARD TWIN SIX Horsepower, Speeds and Starting System Data Also Wanted

Toledo, O.—Editor Motor Age—What is the gear ratio of Resta's Peugeot, of the Stutz racers, and of the Packard twin six?

3—Does the current for operating the Packard twin six starting system come from a storage battery?

4—What horsepower is developed by the Packard twin six?—David T. Davies.

1—The gear ratio of Resta's Peugeot is 2.5 to 1; of the Packard twin six, 4.35 to 1. The Stutz Motor Car Co. will not disclose the gear ratio of its racing cars.

2—Three forward and one reverse.

3—Yes.

4—43.2 according to the S. A. E. standard for measuring horsepower.

MYSTERIOUS KNOCK IN A HUDSON Probably Connecting Rod or Bearing is Loose—Steering Play

Hopkinton, Mass.—Editor Motor Age—There is a knock in the engine of my Hudson 6-40 which can be heard only at a speed of 30 m.p.h. or above. This knock resembles the sound of a hammer beating upon hollow cast iron. It is not present at all at low speeds or when idling, and the position of the spark lever has no effect on it. What would be the probable cause of this?

2—Kindly give the cause of a sharp metallic clank being emitted from the top of the steering column on this car when striking a sharp bump. A Subscriber.

1—This kind of a knock is most likely due to one of two causes. Either you have a loose connecting-rod bearing or one of the main bearings needs adjustment. There is only one remedy for the rod knocks, and that is to remove whatever part of the crankcase gives access to the bearings and to properly adjust them. If shims are placed between the cap and rod end, such thicknesses of these should be removed as necessary to make up for the wear that caused the looseness. The degree to which the bearings have been tightened usually can be determined by

turning or rocking the crankshaft. Tapping the cap with a hammer is sometimes a good indication to an experienced man of the tightness of the bearings.

It should be remembered that there is a happy medium between having the bearings excessively tight and too loose. The babbitt will soon burn out in a bearing which is too tightly set up, or if it does not burn out, it will wear away rapidly. After the motor has had its bearings taken up and adjusted, it is most advisable to run it under light load for several hours before using it on the road. This will serve to wear in the bearings, and during the limbering up process, plenty of oil should be supplied. About the same procedure is required in taking up any play or looseness in the main bearings. Possibly the babbitt will have to be worked down to a smooth surface before replacing the caps.

2—There is probably end play in your steering column, and this can be taken up by removing the necessary number of shims at the base of the steering gear case. The trouble possibly might be the worm and worm wheel. If there is too much play between them, this can be remedied by taking up the slack through the turning of the eccentric bushing with which the worm wheel support is fitted.

ADJUSTING BUICK BAND BRAKES Prevention of Spring Breakage—Drive Carefully and Keep Clips Tight

Akron, Ia.—Editor Motor Age—I have a 1914 model 37 Buick. How could the external contracting brakes be fixed to prevent rattling?

2—Have broken seven springs. Is it possible to fix the springs so they will not break so easily?

3—How can one eliminate considerable squeaking and rattling in general? Have tightened up the body bolts and greased the springs, but still the car squeaks and rattles.

4—Is the paint on the 1916 models better than on the 1914 and 1915 cars?—A Buick User.

1—It should not be any great trouble to discover where the rattle is. It might be in the joints of the operating lever or

Questions Answered and Communica- tions Received

W. Walford.....Coventry, Eng.
C. W. Lundy.....Malad City, Ida.
Smethurst Bros.....Warren, Ind.
W. B. Faris.....Ratcliffe, Tex.
A Reader.....Oklahoma City, Okla.
Allen H. Cooley.....Union City, Mich.
A. C. Fisher.....Cedar Rapids, Ia.
A Reader.....Iowa Park, Tex.
David T. Davies.....Toledo, O.
A Subscriber.....Hopkinton, Mass.
A Buick User.....Akron, Iowa
H. F. D.....Victoria, B. C.

No communications not signed with the reader's full name and address will be answered.

the toggle lever, the pins having worn loose. New pins would fix this. Possibly the band itself is too loose on the drum, due to gradual wear of the lining. There is an adjustment at the end of the toggle lever. This brings the ends of the brake band closer together. There is another source of rattle, namely, in the brake rods, which may be too loose. Disconnect the

clevis from the operating lever and after releasing the lock nut turn up the clevis until the rod is just long enough to fit without any looseness.

2—It is safe to say that careless driving is the cause of most of the spring breakage on any car. Proper care of the springs not only when in the garage, but when on the road is essential. Jumping the car over abrupt irregularities in the road or over culverts usually will break any spring that was ever built. Another very prevalent cause of spring breakage is allowing the clips to get loose. They must fit up snug and tight on the springs.

3—Go over the car carefully and fill all grease cups, making sure that they are not clogged, and work properly. Take up the brake rods, as above, and make a general overhauling of the chassis. Prevention of rattle is largely a matter of common sense.

4—Motor Age cannot say as to this. Take it up with the factory.

ANSWER R. E. S.'S FORD QUERY Canadian Suggests Remedy for Peculiar Knock Described by Inquirer

Victoria, B. C.—Editor Motor Age—In Motor Age, September 2, I noticed R. E. S., of Trenton, N. J., has a peculiar knock in his Ford. I had a similar knock in a Ford that I overhauled and I would like to tell him how I got rid of it, for his may be the same trouble.

The camshaft had a very slight lateral play and every time it was in a certain position on the timing gears, it would slap back and cause just the kind of knock that R. E. S. has. I took out the front set screw on the camshaft side of the motor, and cut into the end of it with a chisel, forcing a portion of it over, which made it work like a cam when screwed into place. This consequently forced the camshaft backwards or forwards, depending which shoulder it touched. I screwed it in until it was tight again, and the back shoulder, and the knock has entirely disappeared. It has been like this for over 8 months, and has never returned.—H. F. D.

IGNITION SYSTEMS OF RACING CARS Of Five Machines, Three Use Bosch, One a Mea, and One a Rajah

Iowa Park, Tex.—Editor Motor Age—What ignition system is used in the Stutz, Mercedes, Peugeot, Delage and Lozier racers?

2—What make carburetor is used in these cars?

3—What is the gear ratio of the Stutz racing cars?

4—How much money does Earl Cooper's mechanic get for each race?—A Reader.

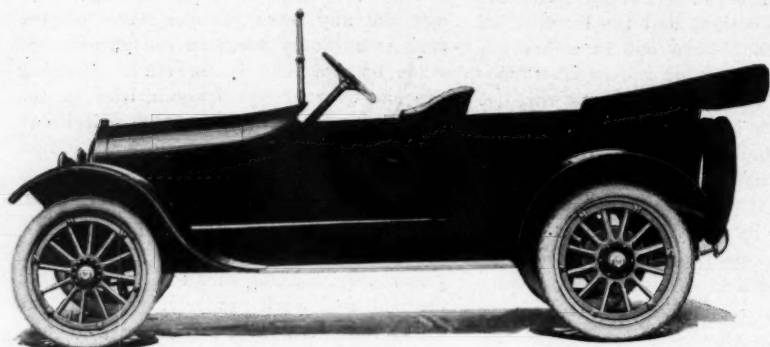
1—The ignition used in the first three cars mentioned is furnished by Bosch magneto, while the Delage uses a Mea magneto and the Lozier a Rajah.

2—Stromberg, Packard, Zenith, Claudel and Rayfield in the order named.

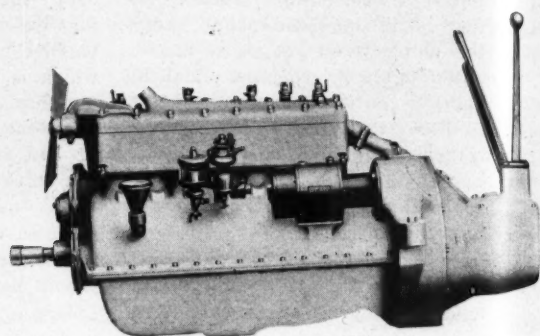
3—The Stutz Motor Car Co. will not disclose the gear-ratio of its racing cars.

4—That is a matter between Stutz, Cooper and his mechanic, which Motor Age does not know.

New Madison Six for 1916 at \$985 as a Five-Passenger Seven-Seater and Roadster Also Included in Program for Next Season



New Madison six-cylinder touring car in five or seven-passenger capacity



Madison six motor showing neat mounting of cranker

NEW MODELS of the Madison car announced briefly in Motor Age, September 2, include a roadster and a five-passenger touring car at \$985 and a seven-passenger touring car at \$1,085. These three bodies are fitted to a single chassis model having a six-cylinder 3 by 5 L-head block engine with a dry-plate clutch and three-speed gearset as part of the unit power plant. The wheelbase of 120 inches should offer sufficient space even for the seven-passenger superstructure.

The engine is a Rutenber with a catalogue rating of 40 horsepower and among its features are the detachable head and nickel-steel valves. These have a diameter of $1\frac{1}{8}$ inch and a lift of $\frac{1}{8}$ inch. The crankshaft is carried on three bearings and these with the connecting-rod bearings are die-cast babbitt. Pistons are of the three-ring type and have an oil relief groove directly under the lower ring. This eliminates any possibility of oil working into the combustion chamber and fouling the spark plugs.

Timing gears have helical teeth and the valve lifters are of the mushroom type, both of which features tend to quiet the valve operation. Lubrication is provided by a constant splash and a vane pump feed direct to the bearings. Cooling is taken care of by a centrifugal pump and full cellular radiator of the modified V shape with a German silver crown.

Remy Electric Equipment

Remy equipment constitutes the electric plant of the car, ignition and lamps being taken care of by a generator with which is combined a magneto type distributor. The other portion of the two unit system, the starter, drives through the flywheel by means of gearing inclosed in the flywheel housing.

From the engine, power is transmitted through a dry plate clutch of the Detroit Gear & Mfg. Co. make. This design uses thirteen disks alternating asbestos face and steel. The gearset is made by the same concern and offers three speeds forward. New Departure bearings are used throughout the gearset. The drive is

taken through an open propeller shaft with universal at either end on the Hotchkiss system, the driving effort being carried through the three-quarter elliptic springs. A specially heavy forward attachment is provided for the lower half of the springs to take this extra effort. The rear axle is an American Gear & Mfg. Co. product, is of the floating type, with large Gurney annular bearings and Brown-Lipe nickel-steel spiral gears in the final drive. The steering is a Warner worm and full gear with an 18-inch corrugated rim and carries the horn button in the center.

Braking system consists of internal and external brakes operating on $1\frac{1}{4}$ by 14-inch brake drums. Tires are 34 by 4 inches with Stanweld demountable rims. The touring car weight is given as 2,840 pounds and that of the roadster is 2,650 pounds.

Equipment includes a ventilating rain-vision windshield, five-bow one-man top, aluminum-covered running boards, double-bulb headlights, Stewart-Warner speedometer, electric horn, double-tire carriers, with one spare rim and a Stewart vacuum-gravity fuel feed.

Detroit Package Wagon for Delivery New Truck Concern Offers Light Vehicle at \$690

A NEW truck-maker has been added to the list of builders of commercial cars. This is the Detroit Commercial Car Co., which has been formed with W. D. Paine, formerly a zone supervisor of the Maxwell Motor Co., as its president and general manager. The personnel of the company other than Mr. Paine has not been made public, but it is understood that sufficient capital is available for extensive manufacturing operations. The product of the Detroit Commercial Car Co. is to be a light delivery vehicle, known as the Detroit Package Wagon, and having a rated capacity of 750 pounds.

Three types of light delivery bodies are listed, one a standard panel body form of vehicle, selling at \$690; another style having an open express body and also selling at \$690, and the third a full panel type of more elaborate body construction at \$745. The chassis is practically the same as that used by a passenger car of similar size.

The car possesses a wheelbase of 106 inches and is powered with a four-cylinder block motor, $3\frac{1}{4}$ by 4. This develops 25 horsepower, it is claimed. The springing is rather out of the ordinary for a delivery car in that the rear suspension is by full cantilever springs. Tires are 30 by $3\frac{1}{2}$

pneumatic. Also suggestive of the passenger type of vehicle, is the floating rear axle which incorporates spiral-bevel gearing. Gearset and clutch, both in unit with the engine, are compactly designed. The clutch is a multiple-disk type and the gearset gives the conventional three speeds. The equipment at the prices above includes a single-unit electric cranking and lighting system, which is a desirable feature in light delivery work, saving the time of cranking the engine and having an effect upon the fuel economy.

In detail, the engine offers nothing out of the beaten path. The cylinders are of the L-head form, with all valves on the left, cover plates enclosing the rods in good fashion. To promote lightness, the crankcase, which is of barrel form, is of aluminum, being in unit with the housing of the flywheel. The cylinder block bolts to the case, and a bottom portion serves as the oil reservoir and cover form the bottom of the power plant as well. Its removal exposes all of the main bearings.

Simplification of the intake and exhaust manifolding is brought about by the casting of both in one piece. The intake portion is below the exhaust port, and opening at the bottom center of the combina-

tion being for the carbureter attachment, while the exhaust pipe connection is at the rear. This not only serves to clear up the valve side of the engine, but it has the advantage of bringing the incoming gases into intimate contact with the hot exhaust piping, thus doing much in the interests of vaporization of the fuel.

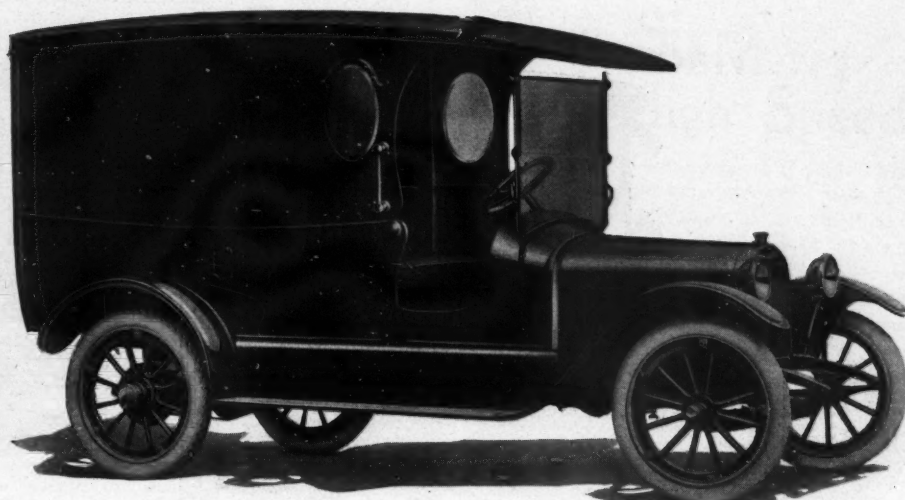
The helical timing gears are neatly enclosed in aluminum housings at the front, while the drive for the motor-generator is provided for by a silent chain running in oil. This electric unit is carried on the right rear side of the crankcase on a specially-provided bracket. The end of the electric unit housing is flanged to bolt directly to the crankcase support, thus making for good alignment of the parts concerned. Operating in the customary manner, the electric unit drives the crankshaft through its chain connection when doing its starting duty, and is in turn driven from the crankshaft when ordinarily running as a generator.

Energy for ignition comes from the storage battery, its distribution being taken care of by a Connecticut coil and distributor mounted in a vertical position at the rear of the cylinder block and driven from the rear end of the camshaft by spiral gear connection.

Cooling and Lubrication

Thermo-syphon cooling in conjunction with a honeycomb type radiator has been well adapted to the car, and splash lubrication has also been nicely laid out for the motor. These two items are very important for commercial work especially, for the cars get little rest, and must have substantial oiling arrangements.

Smooth action of the clutch is also very important, and the maker states that the matter of gradual starting has not been lost sight of. Many times, costly and fragile merchandise must be handled without jarring, and thus the clutch is called upon



Detroit Package Wagon with full panel body

to be sweet of action. The clutch is therefore made to run in oil, with the plates held in engagement by one large main spring operating on four levers, the construction permitting the use of a comparatively light spring, and at the same time, owing to the large leverage obtained, providing a heavy gripping power.

Drive is transmitted by a chrome-nickel steel shaft and two universals. The drive is taken on the Hotchkiss principle. That is, instead of having a torsion tube or a torsion rod alongside of the propeller shaft, the springs are used to push the car as well as to take the torque. This makes for a flexible chassis, and is doubtless well fitted for work in the light delivery vehicle field, although somewhat unusual as compared with the average truck or delivery car chassis design.

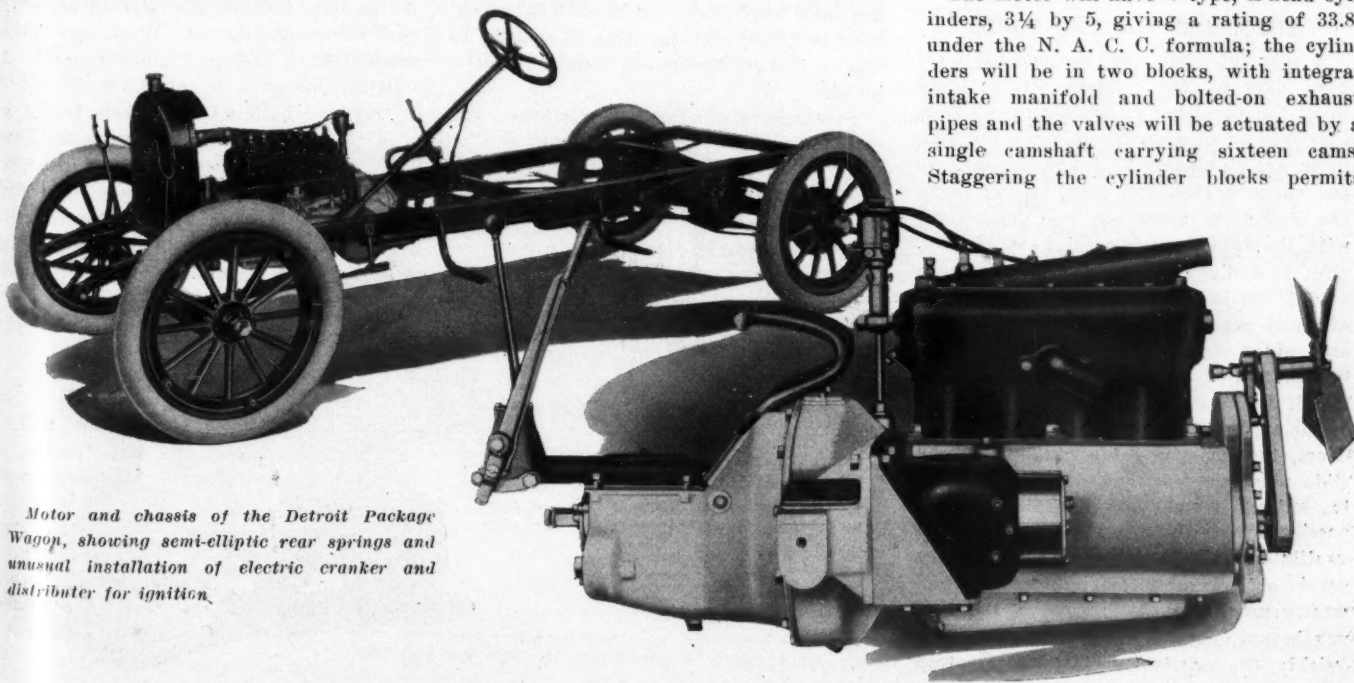
Both differential and driving gears are of chrome-nickel steel, and the mechanism of the rear axle is all mounted on ball and roller bearings. Each side of the spiral-bevel gearing there are both ball and roller

bearings, the latter taking the thrust. At the wheel ends of the axle shafts there are carried by two roller bearings. Brakes should prove amply powerful for the vehicle with their width of 2 inches and 12-inch diameter.

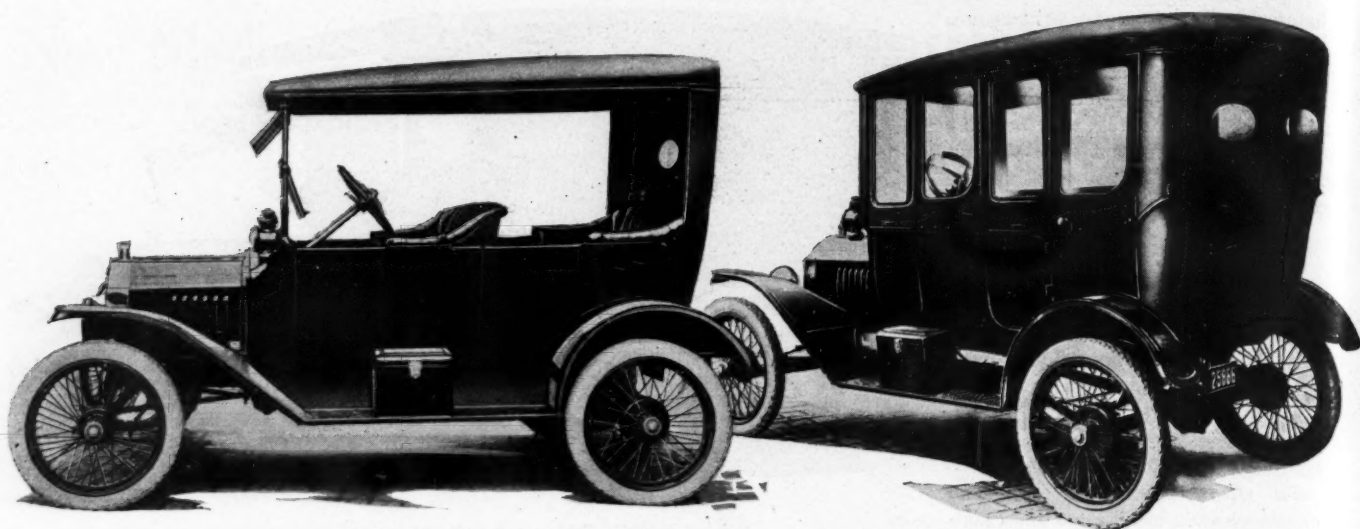
DETAILS OF DANIELS EIGHT

Reading, Pa., Sept. 10—The Daniels eight, which, as was stated in Motor Age for Sept. 9, is to be built by the Daniels Motor Car Co., the president of which is Geo. E. Daniels, who was president and general manager of the Oakland Motor Co., Pontiac, Mich., will be a car built practically to order, to sell for \$2,350. The wheelbase will be 127 inches and the tires 34 by 4½. Unusual attention will be given to the finish and equipment of the seven-passenger body, which will have a double cowl. Heavy mahogany rail all around the top, long-grained, hand-buffed leather upholstery, mahogany cabinet fittings and other luxurious features.

The motor will have V-type, L-head cylinders, 3¼ by 5, giving a rating of 33.8, under the N. A. C. C. formula; the cylinders will be in two blocks, with integral intake manifold and bolted-on exhaust pipes and the valves will be actuated by a single camshaft carrying sixteen cams. Staggering the cylinder blocks permits



Motor and chassis of the Detroit Package Wagon, showing semi-elliptic rear springs and unusual installation of electric cranker and distributor for ignition.



Detroit removable top for Fords in both its open and inclosed forms

placing the big ends of the connecting rods side by side on the crankpins, which are made sufficiently long for the purpose. Water circulation will be by duplex centrifugal pumps, lubrication by pressure feed, ignition, lighting and starting by Westinghouse system. The carbureter will be a Zenith.

A Brown-Lipe-Chapin three-speed gear-set will form a unit with the motor, the disk clutch will run dry and will have a ball-bearing release. Two Spicer universals will be used on the propeller shaft, which will be uninclosed; drive will be taken through the springs, and an arm will resist torque stresses.

Three-quarters construction will be employed for the rear axle, which will have taper roller bearings, spiral bevel gears and pressed steel housing. Rear springs will be semi-elliptic, underslung, 2½ inches wide. The gasoline tank, of 20 gallons capacity, will be hung at the rear, a vacuum system feeding the carbureter.

LIMOUSINE TOP FOR FORDS

A removable top designed and built for Ford cars by the Detroit Weatherproof Body Co. furnishes either a closed limousine type or an open design when the windows are dropped. The top is ready to put on, a wrench and screw driver being the only tools necessary, and for owners with the 1914 Ford, a special cowl is supplied at a slight additional cost. Top sells at \$77 and has a canopy framework made of wood with sheet-steel braces. The top and sides are covered with imitation leather, which is waterproof, and the inside lining is gray cloth.

The side panels are of plate glass. The doors, the Barbour patent flexible design, slide noiselessly up and down, disappearing entirely from view when raised. It is possible, partially, to open the doors for ventilation. With everything closed, the car is entirely and completely storm and weatherproof, but by removing the side panels and doors, which can be done very quickly, the smartest of fair weather tops

is produced. A rain vision ventilating windshield is included with the equipment of the top.

BRINGS OUT UTILITY TRACTOR

Antigo, Wis., Sept. 10—The illustration on this page shows the Utility steel tractor brought out by the company of the same name in this city recently. It is a four-wheel-drive arrangement steering with both axles. The engine used is a four-cylinder, heavy-duty governor type, which has three speeds forward and one reverse. The gearset is so designed that when the engine is working under load, such as pulling four or five plows, it is direct-connected. The power is not transmitted at this time to any intermediate gears. From this condition there is a step-up in speed and also a step-down as well, providing either more power or more speed, as desired. In the way of material, all the castings are of steel, the gears of alloy steel with hardened and ground teeth and the bearings are Timken rollers. The wheel-base is 8 feet and the over-all length, 12 feet 6 inches, the width being 6 feet 6 inches.

Two sizes of tractors are built, the large

one weighing 7,500 pounds and the smaller, 5,500. The large size is capable of pulling four or five 14-inch plows and the small size, three or four 14-inch plows. The tractor easily is handled, due to the fact that both axles turn.

NEW CADILLAC TRUCK CONCERN

Cadillac, Mich., Sept. 10—Stockholders in the new truck company organized here have decided to name the concern the Cadillac Auto-Truck Co. They elected the following officers: Walter A. Kysor, president and general manager; John P. Wilcox, vice-president and C. J. Helm, secretary-treasurer. The board of directors are Cadillac men. Details as to the truck that will be made will not be disclosed until the plans have been finally ratified by the officers.

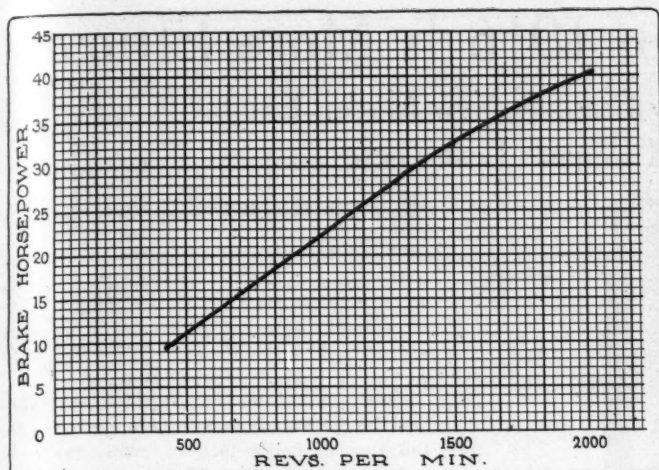
WACO NEW SEATTLE CAR

Seattle, Wash., Sept. 11—The Western Automobile Co. recently was incorporated here to manufacture the Waco car. Those interested in the new concern are C. A. Cawley, George L. Grant and S. W. North. A factory building has been leased at Rainier avenue and Lane street for manufacturing purposes. The first car already has run 2,000 miles and spring delivery of car is promised.



Utility steel agricultural tractor, a four wheel drive, four-wheel steer in two sizes





Horsepower curve of new Rutenber six, showing increase in power to 40 horsepower at 2,000 r. p. m.

THE Rutenber Motor Co., Marion, Ind., has brought out a new six-cylinder motor, model 22, which is the first in which all the gray iron, brass and aluminum castings included in the motor are produced in the Rutenber foundries. This is done with two purposes; first, to guarantee against any shortage of materials; and secondly, to insure uniformity in all the metal embodied in this product.

It is a 3 by 5 block in which the cylinder casting is in unit with the upper part of the crankcase. With the six cylinders and upper part of the crankcase cast together and valves inclosed, with the cylinder heads detachable in one piece, a simple exterior is furnished which conforms to the latest dictates of compactness in engine design. While this motor is rated

D²N

at 21.6 horsepower according to the —

2.5

formula it is said by the makers to develop 41 horsepower at 2,000 r. p. m. The former rating is reached at about 1,000 r. p. m. This motor, having a stroke of 6 inches,

on the gear cover, and the rear supports by a pressed-steel beam on the standard motor and by arms cast integrally with the bell housing when a unit-power plant is specified.

Light reciprocating parts are employed, the piston length being 3 inches. Pistons cast from close grained iron of the same grade as the cylinders. The valves are interchangeable, having clear diameters of $1\frac{1}{8}$ inches and lifts of $\frac{1}{8}$ inch. Mushroom type lifters operate the valves, the lifters being hardened and ground and carried in two adjustable brackets bolted to the side of the crankcase. One of the features of the motor is the ease with which the valve brackets and lifter mechanism can be removed from the motor by simply taking out the stud nuts which hold them in place. The front and center camshaft bearings are plain and the rear is an S. K. F. double row self-aligning thrust bearing. With this arrangement the camshaft can be withdrawn after removing the gear cover.

The cooling and lubricating systems are conventional, the former being by centrifugal water pump located on the valve side

Rutenber New Six Built for High Speed

has a piston speed in feet per minute equal to the r. p. m. so that at 1,000 r. p. m. the piston speed is 1,000 ft. p. m. and therefore shows the motor to co-ordinate closely to the formula horsepower at that speed.

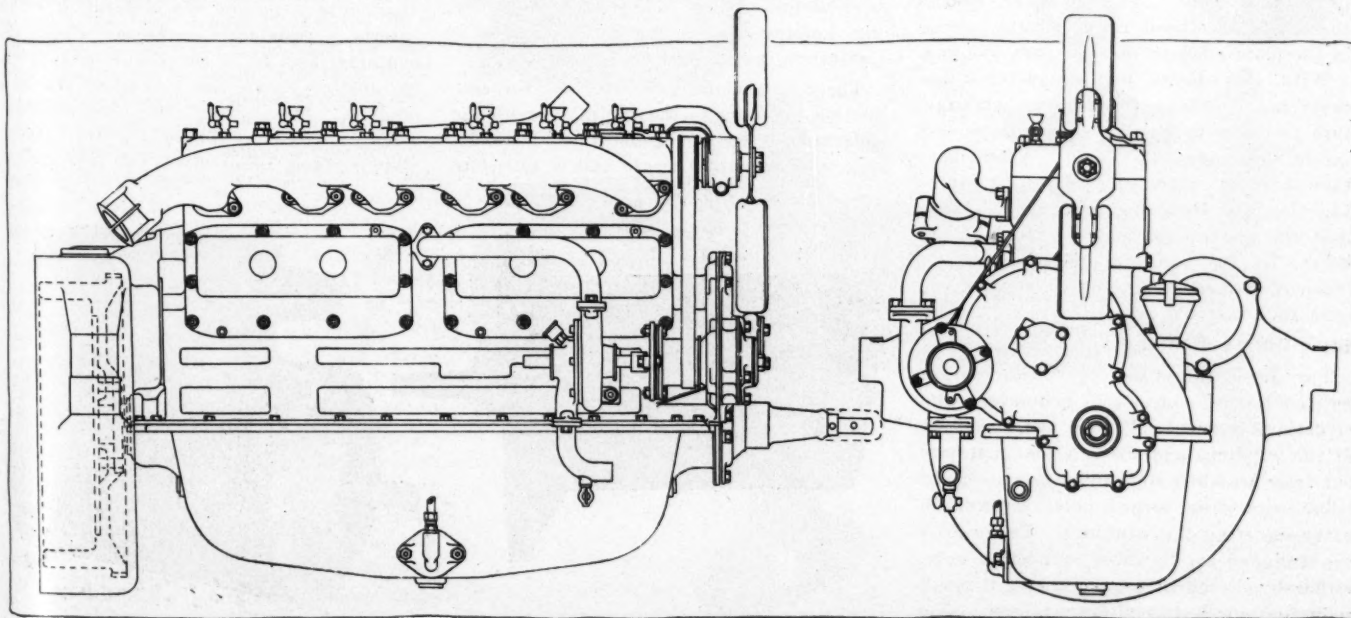
Three-point suspension is used, the front support being

with an optional arrangement of drive from the generator and magneto shaft mounted in front of the ignition generator if the magneto is not used. This shaft, like all the other units in the gear drive, is operated by helically cut gears. For lubrication, a vane pump driven directly from the front end of the camshaft draws oil through a detachable filter in the base and delivers it to troughs under each connecting-rod and to the gears. Direct feed supplies the main bearings by means of ducts cast in the walls of the upper case. Provision is made for attaching a pressure gage, if desired.

Any standard make of two-unit system can be fitted to the motor, special allowance being made for such units as the Westinghouse, Remy, Gray & Davis, Bijur, etc., either combined with ignition or separate magneto. The motor weight is given by the manufacturer as 420 pounds, ready for installation.

MOTOR CARS ON RAILS BARRED

Milwaukee, Wis., Sept. 10—Practice of motorists in isolated districts of Wisconsin of equipping their cars with flanged steel wheels for use on railroad tracks and carrying passengers at regular rates has been stopped by a decision of the attorney-general of Wisconsin to the district attorney at Medford, Wis., declaring it to be a violation of the statutes for a person to operate a motor car on railroad tracks without the permission of the company owning the tracks. The attention of the district attorney was called to the fact that a man is operating a car on the Soo line between Riblake and Chelsea, Wis., carrying passengers at 50 cents for each trip.



Side and end views of new Rutenber model 22 six-cylinder motor

Bijur Electric Equipment for 1916 Is More Efficient

Five Types of Apparatus for New Season—New Models Exhibit Greater Compactness and Require Less Energy

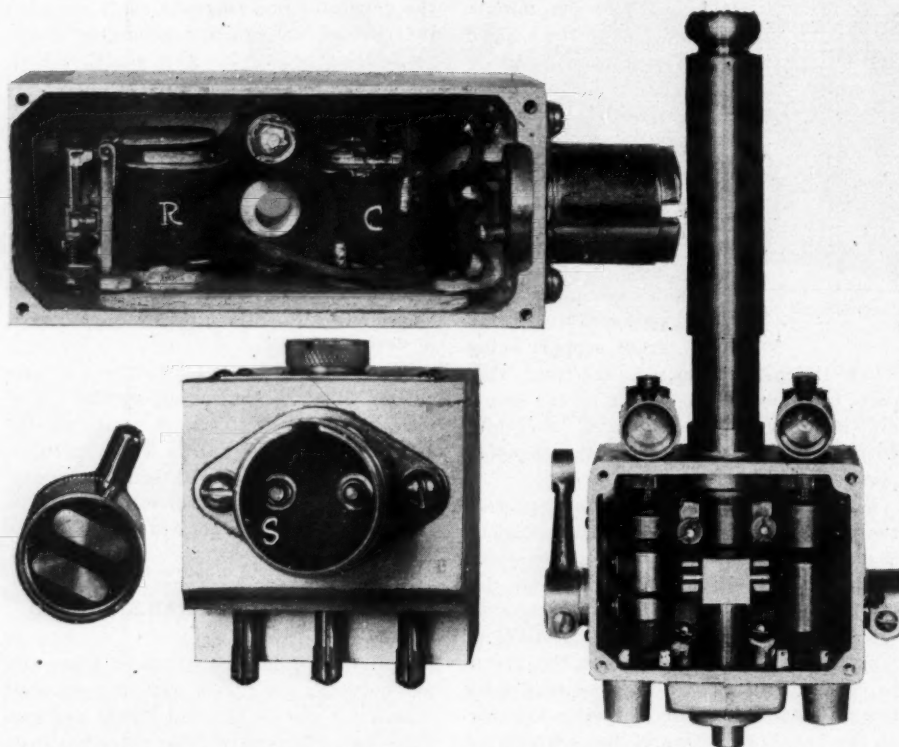


Fig. 1—Some features of Bijur Equipment. Above, regulator R and cut-out C; left, plug and center, socket S for connection of regulator; right, plunger-operated starting switch

DEVELOPMENT of electrical equipment for the motor car has taken place during the last 2 years chiefly in increased efficiency in conjunction with a marked reduction in the size and weight of the principal units. Compactness is a fundamental requirement and this has led to the cutting down of much metal in generator and motor construction, especially in regard to the magnet, though there has also been much weight saving in the more efficient and compact winding.

With this desire for compactness has come the necessity for ease of manufacture in order to keep the production cost inside the competitive field. After more than 3 years' experience the Bijur Motor Lighting Co., Hoboken, N. J., has decided that the above requirements are best obtained by the adoption of a simple cylindrical form for the field magnet casing with four inserted poles.

Bijur Outfits Similar

For 1916, therefore, the Bijur output will consist of motors and generators constructionally identical, with the exception of the windings and size. All magnets are cut from seamless steel tube. All are four-polar with drop forged poles screwed in after inserting the windings. The motors are designed for flywheel connection only, either by direct sliding pinion or through reduction gear and sliding pinion. The Bijur company, however, does not supply

gearing, believing this to be the business of the car builder.

Bijur generators are divided into two classes irrespective of size, namely, the constant-current type, in which the output is governed inside the generator by means of the third-brush principle, and the voltage regulated type, in which a special vibrating regulator of Bijur design is mounted on top of the generator casing, holding the voltage by the use of a resistance inserted in the shunt field.

There is a motor-generator set for connection by chain to the engine, besides the separate motor and generator. This design is remarkably simple and is suited to

the needs of the smaller sizes of power plant.

The outfits can be classified as follows:

- | | |
|--|---|
| A Constant current generator geared motor | B Constant current generator direct acting motor |
| C Voltage regulated generator geared motor | D Voltage regulated generator direct acting motor |
| E Motor-generator | |

The constant current type of generator has the great advantage of simplicity, all the control being located inside the generator casing. The third brush principle is used, Fig. 4, in which the speed of the armature controls the amount of current passing through the shunt coils by field distortion. There are no moving parts in connection with the control and therefore nothing to get out of order.

Voltage Regulation

The voltage regulated generator is governed by a vibrating regulator which is made only in one size for mounting on the magnet casing. This regulator differs from others of similar type in the arrangement of the contact points, Fig. 1, which are fitted to the ends of brass reeds so as to preserve a clean contact surface at all times by varying the actual point at which the spark occurs. The coil is arranged vertically with the hinged iron armature above. Behind the hinge on an extension of the armature one of the two reeds is fitted, while the other reed, representing the fixed point is arranged horizontally so that the weights at the ends, in which the platinum points are inserted face one another. An adjustable spring which holds the armature away from the core is provided.

When attraction of the armature takes place as the speed of the generator rises the contact points are separated. This inserts a resistance connected across the contacts, Fig. 5, in the shunt field, thereby cutting down the power of the field magnet. The spring then returns the armature and again closes the points, allowing the shunt field full current on

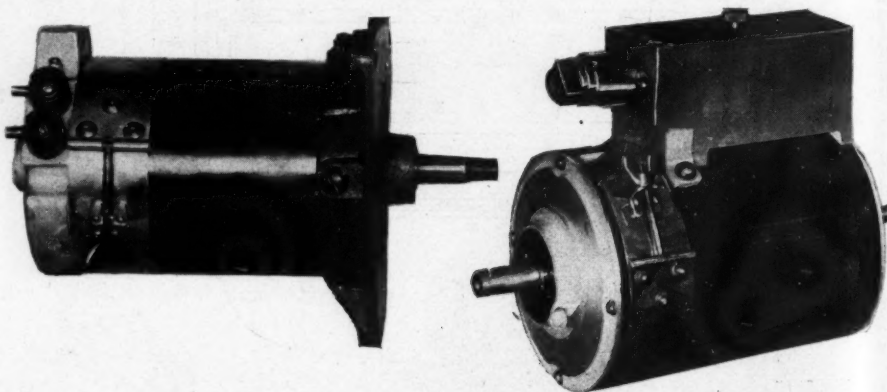


Fig. 2—Two Bijur electric units, the one at the right showing regulator mounted on the generator

New Stewart Electric Horn Sells at \$7.50

THE Stewart-Warner Speedometer Corp., Chicago, is marketing a new member of the Stewart family of accessories, a motor-driven horn, to sell at \$7.50.

The device consists of four major parts—the motor, motor shell, diaphragm and projector. The front end of the motor shaft is equipped with a toothed collar, the teeth of which

The commutator is built from hard-drawn copper to insure long wear, while the brushes are of specially large size to eliminate electrical resistance. The front bearing, which takes care of all the radial load, is made of bronze. The manufacturer claims that the motor will not stick, since close attention has been given to bearings and correct lubrication. The rear bearing, which takes the thrust, is provided with a hardened steel ball which comes in contact with the ground end of the armature shaft. The contact is just a point, which makes for elimination of friction.

DALLAS TALKING SPEEDWAY

Dallas, Tex., Sept. 10—There is a movement on foot in Dallas to have erected a speedway along the lines of the Chicago track. Definite plans probably will be made soon to carry out the work. It is pointed out that between the time of the New York races at Sheepshead Bay and those at Chicago in October and the grand prize and Vanderbilt races in California in the winter there is a period when the star drivers are idle and would be glad to come to Dallas as a stopping point on their trip from the east to the west. It is suggested that a purse of \$25,000 be offered.

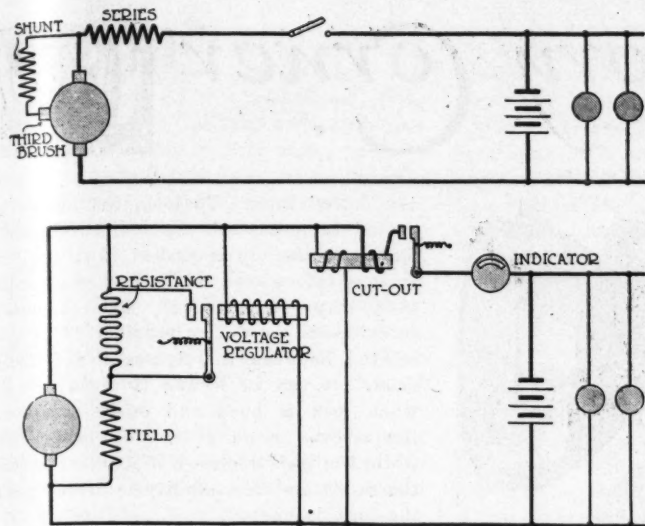


Fig. 4—Third-brush wiring for Bijur motor-generator
Fig. 5—Connections for voltage-regulated generator

which the action is repeated. On high speeds this armature vibrates at a fast rate and the claim is made for the special reed arrangement that the contact points cannot become pitted owing to the sideways vibration of the surfaces.

In the same rectangular aluminum casing, Fig. 2, the cut-out C is fitted and all the connections to the generator are made by plugs which are inserted into sockets in the generator casing. No electrical knowledge is required in changing the regulator. The act of putting it in place on the generator and fastening it by the single thumb nut automatically makes all necessary connections through the plugs.

This feature is of great value in the case of a breakdown or failure on the part of the regulator. All the dealer does is to remove it, forward it to the maker and replace with a new one. By this arrangement the maker can seal up the regulator and repair according to guarantee only when the seals are unbroken. The connection to the outer circuit is made through a two-point plug, which is inserted in a socket, S, in the end of the regulator casing. This plug is provided with a small handle which can be moved over now and then when the owner thinks of it. The effect of which is to cause the current to reverse its direction through the contact points.

Reversal Keeps Points Clean

This reversal neutralizes the slight deposit of platinum from one point to the other which always takes place on the points of a spark gap in which the current flows for long periods in one direction.

The starting motors are series wound and in the direct-acting type have either a squared shaft to take the sliding pinion or a screwed shaft for the self-acting momentum type of pinion. In the latter design the revolving shaft pulls the pinion automatically into mesh; the flywheel throwing it out again as soon as firing commences.

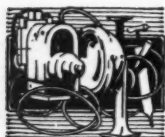
strike a button placed near the middle of the diaphragm, thus producing a characteristic sound. The sound producing mechanism will be noted in the accompanying illustrations of the various parts of the signal.

The warning signal is said to weigh about one-half as much as other motor-driven signals, sound considered. It requires a small amount of current to operate, runs at highest speed with small amperage, winding of the motor is protected from moisture by baking the fields and armatures for a long period and the design is such that even the great centrifugal force does not displace the wires or ground them.

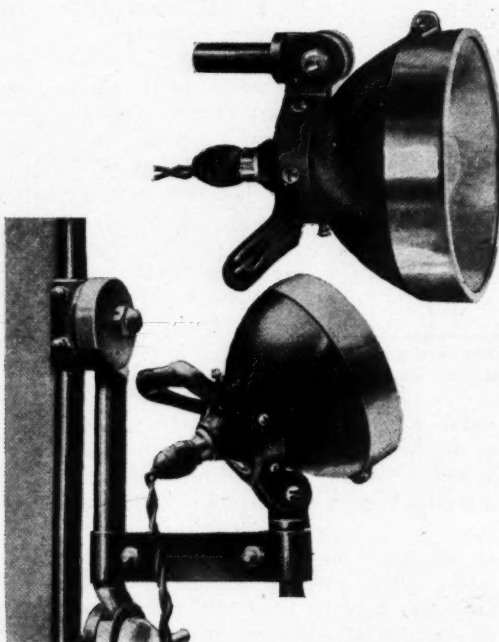


STEWART \$7.50 ELECTRIC HORN

Note oiler N on motor shaft. Toothed collar C is rotated and strikes button B on diaphragm, producing characteristic sound



The Accessory Corner



PITTSBURGH FIVE SEARCHLIGHT AND ORIGINAL STREET SEMAPHORE

The lower view of the lamp shows it attached to the car; the other illustrates its use as a trouble lamp. The traffic device is similar to several now in use in the larger cities

Neverout Direct Heating System

DESIGNED for the purpose of eliminating leaky radiators, cracked cylinders, frozen bearings and bursted water pipes in cold weather, the Neverout direct heating system made by the Rose Mfg. Co., Philadelphia, Pa., offers a solution to one of the car owners' greatest winter problems in connection with their cars.

Built along simple lines, this device offers a means of circulating warm water in the water-circulating system of the motor, applies heat directly where it is needed and at the same time is said to furnish sufficient heat to warm the ordinary garage. The Neverout practically is a heater within a heater, the outer portions being screened the same as a miner's lems in connection with the care of their cars.

This device burns kerosene and has a capacity to run from 36 to 48 hours with one filling, according to the size of the flame. Heat is brought to sufficient intensity by means of a special blue flame, which is protected by a safety screen from the atmosphere. This heat passes to a large copper coil where the water is heated and flows by natural circulation to the top of the radiator by means of a rubber hose. From the bottom of the radiator another pipe runs to the lower end of the copper heating coil. This latter pipe is attached to the radiator drain cock, or if there is no drain cock one that may be installed easily is furnished. Special care has been given to the draft system and it

is claimed that even after long periods of use there is no smoke, odor or dirt.

Operation costs $\frac{1}{4}$ cent an hour. The illustration gives an idea of how the device is attached, but by dividing the pipes two or more cars may be heated.

Singer Signal

In describing the Singer signal, made by C. A. Singer, St. Louis, Mo., in the September 2 issue of Motor Age, the height of the letters was erroneously given as $\frac{1}{4}$ -inch, the height being $1\frac{1}{4}$ inch. The words—stop, slow, right, left—are flashed from a housing, or box, 8 inches long and 6 inches high.

Automatic Ignition Lock

A combination keyless lock for ignition systems, designed to operate on any make of car, having either high or low-tension magneto, separately, or magneto and a battery, is being offered for sale by the Novelty Distributing Agency, 343 South Dearborn street, Chicago, sole distributor for the United States. It is a push-button lock with sixteen buttons, admitting of a great number of combinations. To open, the right buttons must be pressed simultaneously, without pressure on any of the other buttons.

Reference to the illustration on these pages shows how the device operates. The dotted outline at the top shows the lock as it appears when closed. When pressure is put on the correct combination, this springs upward and releases the lock lug inside, after which the handle below may be moved to right or left as indicated by

the dotted lines. To lock, the handle is placed in a neutral position, the locking device at the top is pushed down until it springs into place. If desired the handle then may be removed. One concealed screw holds the device together. The key located between the figures 1 and 16 is false. It can be swung to right or left when lock is open and offers access to the screw. Even if this is broken off while the lock is closed, a shoulder covers the screw and accessibility is denied until the lock is opened.

The Automatic is made of brass, nickel plated and polished. The face measures 3 inches in diameter. It may be fitted on the dash or any other place the owner desires. Price \$7.50.

Easyon Tire Chains

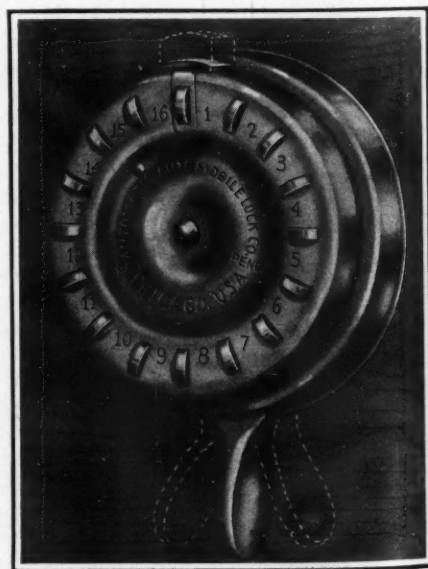
Easyon tire chains, designed to prevent wheel-spinning on any kind of roads, will have a number of improvements for the coming season, according to the Leather Tire Goods Co., Niagara Falls, N. Y., the manufacturer, who announces that the 1916 line is ready for delivery.

The improved chains are said to be much stronger and neater in appearance than their predecessors. They admit of more easy attachment, the new cross chains being the same on both sides.

They sell for \$3.20 a set in the small size, which fits 3, $3\frac{1}{2}$ and 4-inch tires, and \$4 a set for the larger size, adapted for use on 4, $4\frac{1}{2}$ and 5-inch casings. These prices include parcel postage.

Tulite Auto Bulb

Combining two separate and distinct lights in one, the Tulite bulb, marketed by the Tulite Auto Bulb Co., Detroit, Mich.,



AUTOMATIC IGNITION LOCK

This device offers a series of combinations and a number of unusual features

is designed solving the headlight glare problem. Two types of this bulb are shown elsewhere in this department, type R being inserted in the lamp with the minor filament above the major, projecting the light to the roadway at short range. This allows the focusing of a strong headlight as far ahead as desired and, when switching to the minor filament, a good driving light at 40 to 75 feet in front of the car. Type A has a minor filament, mostly surrounding the major and diffuses the light in a general way, covering eight to ten times the area of the major filament when lighted.

The standard Tulite bulb is 4 candlepower on the minor and 20 candlepower on the major filament, but other combinations are furnished.

Full wiring directions accompany each set of lights.

Original Semaphore

The Original street semaphore, made by the Street Signal Semaphore Co., 2154 North Carlisle street, Philadelphia, Pa., shown in this department, is a device that embraces an automatic gong in the place of a police whistle, which sounds once for north and south traffic and twice for east and west traffic, with a clear interval between so as to eliminate misunderstanding of signals. It also is equipped with an umbrella to protect the traffic policeman, who operates the device with levers. A neat collapsible weatherproof booth is furnished if desired. This has celluloid windows from which the officer can see in all directions. Prices range from \$5 to \$200, according to the elaborateness of the device ordered.

Pittsburg Five Searchlight

The Pittsburgh Electric Specialties Co., Pittsburgh, Pa., is offering a new searchlight known as the Pittsburgh Five. It is provided with an outside set screw focusing adjustment, which permits the use of any style lamp, regardless of size or voltage, and makes it possible to adjust

the lamp instantly for any kind of beam without disturbing it in any way, or removing it from its position.

Due to this accessible adjustment, the lamp may be transferred from one car to another of different voltage at will. It also enables the user to select a bulb to suit his requirements and, in case of accident, to use any available bulb as a renewal. Should it become necessary to use the searchlight as a headlight, the width of the illuminated field can be increased as desired.

Another feature of the Pittsburgh Five is the double curvature parabolic reflector which, though only 5 inches in diameter, is said to produce as much beam candlepower as any large headlight, with an even distribution of the light. It is equipped with a handle for use in holding it in an upright position when detached for use in making repairs on the car at night.

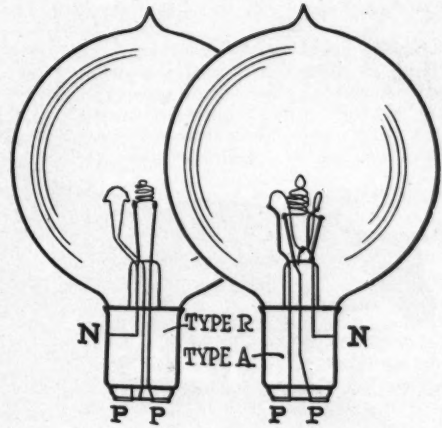
Campbell Bearing Puller

The Campbell bearing puller answers the call for a device for pulling magneto, electrical generator, or other bearings of this type which so often is a necessity in shops doing work on electrical apparatus. With this device, it is necessary simply to slide a large knurled ring back toward the handle of the device, allowing the jaws to expand. The puller is then placed over the bearings and the ring again pushed back toward the bearing which will lock it in place after which the bearing can be pulled out by turning the handle screw to the right. The puller is adjustable to different sized bearings without any other tools which makes it a valuable device since it is self-contained. The material used is steel throughout. The device sells for \$10 and is made by the Campbell Auto Works, Stockton, Cal.

Milburn Electric Charger

A charging apparatus which any owner can use to charge the battery of his electric passenger car now is out under the name of the Milburn light electric charger. It is designed especially to meet the needs of a person who desires to take care of his own batteries. With it, the electric car owner need only turn the main switch in the car to charge position, insert the charging plug in its receptacle and close the switch in the wall panel provided with the apparatus.

The machine consists of a compound-wound, direct-current generator direct connected to a standard, single-phase, squirrel-cage induction motor. The squirrel-cage motor is non-self-starting and the outfit depends upon starting from the direct current end. This is accomplished by a four-pole switch, the two middle prongs of which stick up higher than the others. After the switch is thrown in slowly, the shunt field is excited and then the armature of the direct current end thrown directly across the battery. The set then begins to revolve, the generator acting as a shunt motor, the series field being cut out by means of the clip. As the switch



TULITE AUTO BULBS

Type A shows minor filament nearly surrounding major; type R, the minor slightly above the major

is thrown into the last step, the alternating current is thrown on to the motor and the outfit starts to charge the battery. Being compound-wound, the outfit approaches a constant potential method of charging, the charge starting at a high rate and slowly tapering to a low finishing rate. This gives a charge which is non-gassing and very materially will increase the life of the battery. The outfit is made two-bearing, ball-bearing so that difficulties from bearing trouble largely are eliminated.

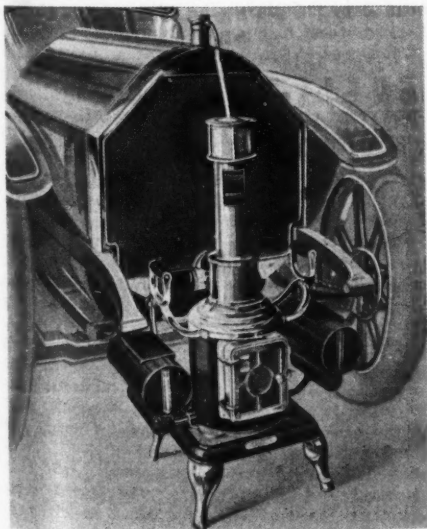
The price varies from 110 or 220 volts 60 cycle at \$130, to 25 cycle, which sells for \$140. It is made by the Lincoln Electric Co., Cleveland, O.

Stevens Duplex Reamers

A new line of reamers specially designed for repairmen handling Ford cars has been brought out by Stevens & Co., New York, under the name Duplex. These reamers are made for fitting of spindle bodies and spindle arm bushings. The diameters of the two reamers, which are contained in the one tool, are 0.564 and 0.506 inches. The reamer is supplied with both straight and twisted flutes. Other reamers made by the same concern are plain and expanding types of special Ford sizes for use on worn or refinished parts. These are used in work on various bushings in the Ford car and can be brought up to 0.005 inch oversize, when desired.

To meet the demand for a cylinder reamer that can be used in an ordinary drill press, the same concern is marketing one which is made with inserted blades, having a cutting angle in clearance requiring but little power to operate. This reamer is fitted with a No. 4 Morse taper reamer shank and the maker states that it will ream the Ford cylinders accurately in 15 minutes. It enables the reaming of cylinders for taking $\frac{1}{2}$ inch oversized piston.

The price of the Duplex reamer is \$2, for the cylinder reamer 16\$. Prices for the plain and expanding reamers will be given on request.



NEVEROUT DIRECT HEATING SYSTEM

Showing method of attachment to car radiator. Can be used on two or more cars at one time



From the Four Winds

ROADBUILDING Progress Told in Movies—The above picture was made at Martinsville, Ind., recently when an Indianapolis moving picture camera man was there taking the initial pictures of the Dixie highway film. The yoke of oxen was driven 26 miles to be in the photograph, and portrays the old and new means of travel. It is owned by J. H. Boyer, Bear Wallow, Ind., and still is used in farm work. The film when completed will show the old highway of 50 years ago and the transformation of today. In the motor car is W. S. Gilbreath, field secretary of the Dixie, and several young Martinsville women, one of whom may be the lucky Dixie highway queen.

NEW JERSEY Licenses Increase—Motor vehicle registration fees in New Jersey, for the eight months of this year, were \$980,160, which is \$165,653 in excess of the total fees collected for 1914.

Wisconsin Registration—Licensing of 100,000 cars in Wisconsin for 1916 is anticipated by the action of the secretary of state in making a contract for 200,000 license plates, a pair for each car. The 1916 Wisconsin license plate will have a cardinal field, with raised figures and letters in white.

Full Fee for Classification Change—When a motor car owner wishes to change his machine from one classification to another under the new motor law in Washington it is necessary for him to pay the full fee under the classification and not just the difference between the classification under which the car was originally placed and the new classification.

City Motors Not for Joy Riding—Mayor James M. Curley, of Boston, Mass., has given orders that all the cars owned by the city which were being cared for at a garage conducted by J. P. Collins, be taken elsewhere after September 1 as a result of a joy ride in one of the city machines last week. The mayor is considering plans for a municipal garage and he will send to other cities to get information on the subject.

Illness Common to Motor Workers—Dr. Eugene Lyman Fisk, director of hygiene at Life Extension Institute, in an address before the American Public Health Association at Rochester, N. Y., last week, told of an examination of 1,000 motor factory workers, who, in spite of working under the most favorable conditions, showed premature aging as evidenced by arterial changes varying from slight fibrosis to advanced arteriosclerosis, or hardening of the arteries.

Blue Law Bans Motors—Pleasure-riding in motor cars on Sunday is under the ban of the Methodist Episcopal church of Wisconsin, according to resolutions passed at the annual convention of the West Wisconsin M. E. Conference in Eau Claire. All communicant members of the church are appealed to and strictly urged to obey and observe the rules against laboring on the Sabbath. Among the Sunday acts upon which a ban is placed are: Reading or

advertising in Sunday newspapers; riding or driving a motor car on Sunday; riding on trains; attending sports, theaters, picture shows, etc. The ban on motoring, the resolution says, arises from the fact that "it is causing so many Christians to backslide."

Richmond Adopts Dimmer Ordinance—Richmond, Va., has put into effect a dimmer ordinance. Fines for violation vary from \$1 to \$5 for first offense and \$5 to \$25 for each succeeding violation.

Ohio Registration Fee Halved—Beginning September 1, the cost of registering motor cars in Ohio was reduced by one-half, in accordance with a law enacted by the last general assembly. The cost of registering a gasoline car has been reduced from \$5 to \$2.50 and an electric from \$3 to \$1.50.

Cuff Link Grounds Ignition—Here is a novel one from the land of steady habits. A Collinsville, Conn., man had his car stalled. He was at a loss to know just why. It ran perfectly when he left the house, but suddenly stopped and could not be started. A broken cuff link which had been dropped in the hood two days before was found to have caused a short circuit. On removal of the link the car ran all right.

Nervous Woman Jitney Driver Denied License—Hartford, Conn., jitney drivers, besides being required to take out a city license,

which costs \$10, must pass an examination before the police department mechanic. One woman applied for a license this week, but was so nervous in the trial run the license was refused.

Jitney Insurance Company Licensed—The National Indemnity Exchange, Kansas City, Mo., organized last spring when the jitney industry first got under way, for the purpose of insuring jitneys, at last has received its license from the Missouri insurance department.

Jitney on Rails—A railroad jitney is being operated on the tracks of the Pacific & Eastern railroad in southern Oregon. It consists of an omnibus body on a standard chassis, and carries eight to ten passengers. Operating between Medford and Eagle Point, 12 miles from Portland, it displaces a locomotive and passenger coach. It probably is the only jitney in the country operating on a standard-gage railroad track.

Wisconsin's Unique Game Law—It is lawful to travel to hunting grounds in a motor car, but unlawful to shoot game birds or animals from a car, according to the ruling of the attorney general of Wisconsin. The last legislature passed a law prohibiting shooting, bringing up the question of whether or not such prohibition covered driving to the place where it was intended to hunt. The attorney-general interprets the law, for instance, to make it unlawful for a motorist-hunter to scare up a covey of birds with his car and then alight from the car and shoot the birds.

Registration Fees in Connecticut—All estimates as to the amount that would be taken in by the Connecticut secretary of state's office in the motor vehicle department have been exceeded. For the year, up to September 4, the state has taken in \$527,411.69, or \$121,000 more than was received last year. This is an increase of approximately 23 per cent. The state highway department receives all this money for reconstruction work only. As no provision was made by the last legislature for new roads, none will be built. Two years must elapse before action can be taken again on this phase.

Denounces Ford Wages Plan—The Ford Motor Co.'s \$5 a day minimum wage plan was denounced at the third biennial convention of the International Wagon, Carriage and Automobile Workers' Union, held in Milwaukee, Wis., September 7-11. William P. Mavill, secretary-treasurer, said, that worked out in practice, the Ford scale amounts to slave-driving methods and the efficiency system carried beyond human endurance. "It takes six months before a workman receives his \$5 a day," he said, "and the men work three times as hard for

The Show Circuit



Grand Rapids Show—The West Michigan State Fair will open September 20 and there will be a motor car exhibit. The local dealers' association, known as the 3-days' touring in many of the more important cities and towns in this part of the state. The motor car and accessory dealers, the garage and repairmen will be visited and asked to boost the state fair show by attending it and bringing as many prospects as possible.

Ford now as they did under the old scale. Besides, a man is required to show his grocery bill, the number in his family, all his trade accounts, etc. Not 50 per cent of the Ford employees receive \$5 a day. Less than one-third speak English. Henry Ford has not lifted the working people out of the mud, as some suppose. He has reduced them."

Strike Booms Jitneys—Trolley car service on the United Traction Co.'s lines in Albany, Troy, Watervliet, Gretna Island and Cohoes, N. Y., was tied up with a strike of street railway shopmen last week and these cities were invaded by improvised jitneys that did a thriving business.

Three Millions for Gasoline—It is estimated that approximately \$3,000,000 will have been spent for gasoline in Los Angeles during the year when the end of 1915 is reached. Daily sales in the southern California metropolis total about \$8,000.

Would Imprison Drunken Drivers—The Automobile Legal Association, following its stand of a few days ago when it refused to protect its members in cases where intemperance was the chief cause of their getting into difficulty, wants the legislatures to pass laws compelling judges to send to jail men arrested for driving while intoxicated.

Good Roads Activities

Washington Builds Roads—Under the Washington permanent highway law, in effect since 1911, the thirty-nine counties in the state have completed 528 miles of modern roadbed, and in addition 125 miles of road now is under construction.

Omaha's Electric Welcome Sign—An electric sign with the word "welcome," greets the tourists as they come into the eastern side of Omaha, Neb., over the Missouri river bridge. It runs the full width of the bridge and is 8 feet high. On the west side of the sign, for the benefit of tourists going east, it reads, "goodbye, come again." This side also carries the colors of the White Pole route, the River-to-River road and the Lincoln highway.

Iowa Improving Roads—Gangs of men are at work grading Iowa roads and most of the improvements will be completed before wet weather sets in during the fall. Much work has been done during the last summer and Iowa roads next year will be the best they ever have been.

Jackson Highway Vice-President—Crawford H. Ellis, president of the Motor League of Louisiana, has been elected vice-president of the Jackson Highway Association.

Launch Dixie Feeder—Good roads boosters have launched a project on the part of Breathitt county, Kentucky, for a highway to connect Whitesburg, in Letcher county, with Richmond and the Dixie highway, and designed ultimately to supply an artery of travel through the mountains to Virginia and the East. The road is to be known as the Mountain highway.

National Old Trails Marked—The National Old Trails highway west of Kansas City now is completed, sign-posted to the Pacific coast. This has been done by the Automobile Club of Southern California. The marking of the Kansas City-St. Louis section is in progress.

Temporary Change in Ely Road—A change in the Lincoln highway between Ely, Nev., and Salt Lake City, Utah, has been made which greatly will help cross-country travel. While the change only is temporary, it cuts out a bad stretch just west of the Utah-Nevada state line.

Ohio Road Laws—To controvert a statement current that there is no state law regulating the passing of vehicles when going in the same direction, W. H. Walker, Ohio registrar of motor cars sets the matter right by referring to a section of the general code which provides that when a vehicle

meets another going in the same direction the driver of the rear vehicle shall give an alarm and the driver of the front vehicle shall turn to the right, giving half of the road to permit the rear vehicle to pass by the left side.

Propose St. Louis-Chicago Road—Plans are under way for the construction of a concrete highway, brightly lighted and well provided with filling stations, between Chicago and St. Louis, Mo. A corporation has been formed and it is the purpose of the new organization to build the 300-mile roadway for motor cars only, charging each car ½-cent a mile for the privilege of using it.

Trail Given Black Eye—The Ocean-to-Ocean trail has been receiving a black eye this season. The crossing at Valley City, Ill., has been all but impassable, due to the frequent rains, and the ferryman is compelled to land north of the bridge. He makes the modest charge of \$4 for the trip across with a car and party. To make matters worse, two deep mud holes are encountered on the road shortly after leaving highway grade crossings throughout within convenient call, who will pull all cars out of the mire for \$3. If this route is to become popular, better accommodations must be given or all tourists will move via Beardstown, Ill.

Keystone Grade Crossings to Go—The governor of Pennsylvania has made the announcement that the state must make a beginning in the enormous task of abolishing highway grade crossings throughout the state, and he proposed that the thirty-six grade crossings on the Lincoln highway be attended to first. Following the governor's announcement the chairman of the public service commission has directed the

engineers of the commission to make a careful examination of the Lincoln highway crossings.

Paying Townships Bonus—The Pennsylvania state highway commission is sending to township supervisors throughout the state checks covering 30 per cent of the balance due townships as bonus on tax collected for road purposes during 1913 and 1914.

Mark Valley Highway Trail—Last week saw the Illinois Valley Highway trail marked from Peoria to La Salle by the Peoria Good Roads Association.

Plan Illinois Valley Trail—At a meeting of good roads boosters from Joliet, Peoria, Sparland, Bureau, Morris, Ottawa, Peru and other points in Illinois, held last week at La Salle, it was decided to lay out the Illinois Valley trail between Chicago and Peoria via the Illinois river route. A banquet was given by the roads boosters of La Salle and 200 from outside points responded to invitations to attend. It was voted to divide the trail into three sections, Peoria to Bureau, La Salle to Bureau, and Joliet to La Salle. The improvement and marking of the road will be apportioned among the good roads enthusiasts along the route.

With the Motor Clubs

Club Will Continue Campaign—At a meeting of the Nashville Automobile Club, Nashville, Tenn., held last week, it was decided to continue its vigorous campaign in an effort to bring its membership to a point greater than any other motor club in that state. It now has 497 members.

Directors of Club on Tour—Several directors of the Peoria Automobile Club, Peoria, Ill., are making a trip through contiguous counties in an effort to stimulate interest in the club's new home near Chillicothe. The ultimate aim of the club in arousing interest is to bring about better roads in central Illinois.

Chattanooga Club Elects—At its annual meeting held last week, the Chattanooga Automobile Club, Chattanooga, Tenn., elected as its president, William R. Long. J. H. Alday and W. L. Forstner were made first and second vice-presidents respectively; V. L. D. Robinson, secretary.

Massillon Club Organized—The Massillon Automobile Club has been organized at Massillon, O., primarily for the purpose of improving roads in the Buckeye state, contiguous to that city. F. C. Snyder is president, R. B. Crawford, secretary.

Club to Curb Accidents—Aroused by three deaths caused by motor and motorcycle accidents in the last two months, the Manitowoc County Automobile Club, Manitowoc, Wis., has adopted resolutions demanding rigid enforcement of laws governing the operation of motor vehicles in Wisconsin.

Club Marks Pass Road—All the important junction points on the famous Snoqualmie pass road across the Cascade mountains have been posted by the Tacoma Automobile club, Tacoma, Wash. The signs emphasize the fact that no ferries have to be crossed in reaching Tacoma. The signs are 6 by 24 inches in size, with white lettering on a blue background. It is planned later to post the entire western portion of the state with these signs.

Maryland Club Active—The Automobile Club of Maryland is instituting a vigorous campaign for the fall and winter, for the benefit of members. Watchmen in livery will watch motors at all theaters, opposition to the construction of ornamental circles in the middle of streets is under way as the club believes these obstruct the view and cause accidents, and an effort will be made to have vehicle owners put an end to the dropping of oil and grease on asphalt pavements.

Coming Motor Events

CONTESTS

- September 18—Track meet, Butler, Pa.
- *September 18—Speedway races, Providence, R. I.
- September 24-25—Track meet, Grand Rapids, Mich.
- October 1-2—Track meet, Trenton, N. J.
- *October 2—Speedway races, New York.
- *October 2—100-mile track races, Fresno, Cal.
- October 8—100-mile invitation race, Indianapolis, Ind.
- October 9—100-mile track race, Mattoon, Ill.
- October 16—Speedway races, Chicago.
- November 15-20—El Paso-Phoenix road race.
- November 20—Road race, Corona, Cal.

*Sanctioned by A. A. A.

SHOWS

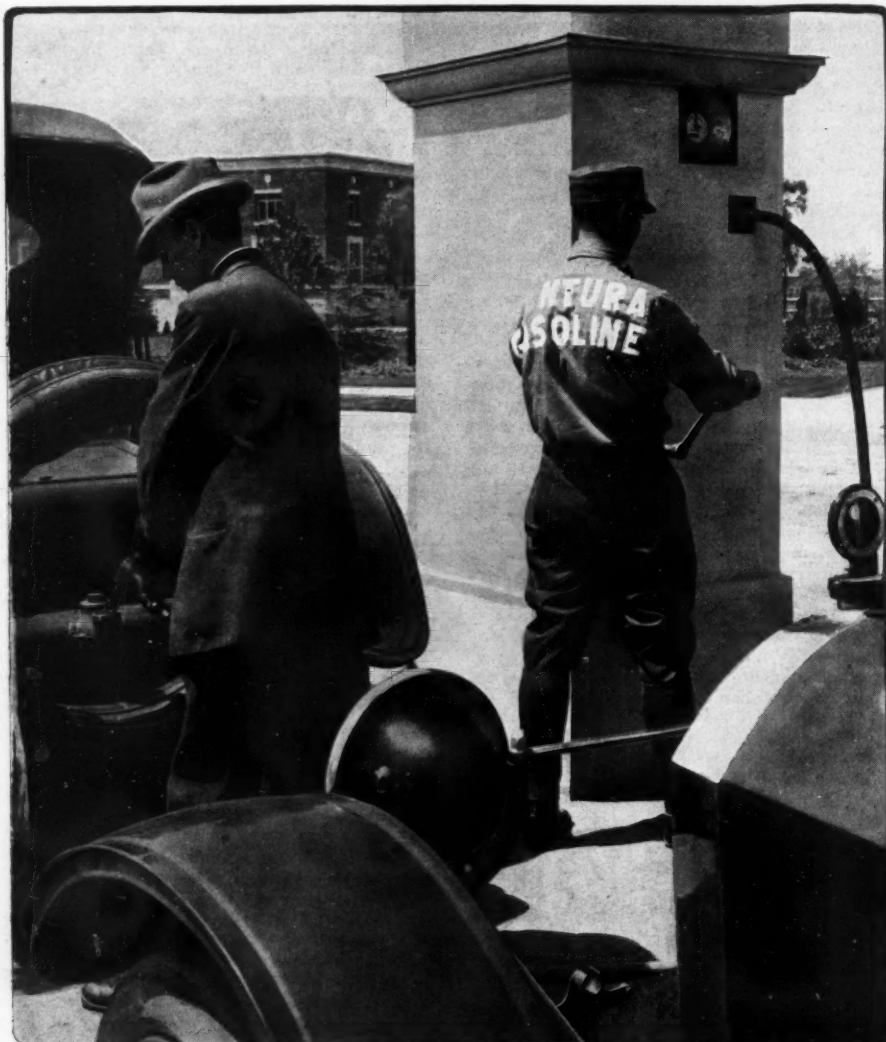
- September 18-25—Los Angeles, Cal., show.
- September 22-25—Rockford, Ill., show.
- September 26-October 10—Denver, Colo., show.
- September 30-October 3—Salem, Ore., show.
- October 2-9—Cincinnati, O., show.
- October 4-9—St. Louis, Mo., show.
- October 15-16—San Diego Exposition show.
- October 16-16—New York, electrical show.
- October 16-22—Montreal show.
- November 1-3—Pasadena, Cal., show.
- January 1-8—New York show.
- January 22-29—Chicago show.
- January 29-February 5—Minneapolis show.
- March 4-11—Boston show.

CONVENTIONS

- September 20-25—International Engineering Congress.
- September 24—Indianapolis, Ind., S. A. E. meeting.
- October 4-6—Columbus, O., Garage Owners' Convention.
- October 14—Chicago, S. A. E. Standards Committee meeting.
- October 17-18—Cleveland, O., Electric Vehicle Association of America.



Among the Makers and Dealers



FILLING STATIONS DESIGNED LIKE MISSIONS—California's missions have been copied in the construction of the service stations operated by the Ventura Refining Co., in Los Angeles, Cal. Throughout the city miniature models of the old Mission San Buena Ventura have been constructed which add to the beauty of the city instead of making unsightly corners, the great fault of the first filling stations opened in Los Angeles and other southern California cities. A feature of the mission filling stations is the concealed gasoline pump, which is built within a column with only the pressure lever and gauge exposed to the view.

AKRON Company Changes Name—Papers have been filed changing the name of the O'Neil Tire and Protector Co., Akron, O., to the O'Neil Tire and Rubber Co.

Wollering Studebaker Director—M. F. Wollering, production manager of the Studebaker Corp., has been elected as a member of the board of directors.

3,000 Scripps-Booths to Paris—Peters & Sons, Ltd., Paris, France, have placed an order for 3,000 Scripps-Booths to be delivered during the coming season.

Hudson Far East Representative—The Hudson Motor Car Co., Detroit, Mich., is sending Alfred T. Salmen as a special export representative to Australasia, Asia and South Africa.

Detroit Buys Plant—The Detroit Motor Car Co., Detroit, Mich., has leased the plant which at one time was the home of the Wolverine Mfg. Co. In its new quarters the

Detroit company will have more room to develop its business. Within a few weeks it is expected that the 1916 models will be ready for announcement.

Mogul to Build Assembling Plant—The Mogul Motor Truck Co., St. Louis, Mo., is planning to erect a large assembling plant at St. Louis.

Garlent Goes to King—J. E. Garlent has resigned from the Hupp Motor Car Co., Detroit, Mich., and now is factory manager for the King Motor Car Co., Detroit.

Willemin Moves Up—A. B. Willemin, for several years purchasing director for the Hupp Motor Car Co., Detroit, Mich., has been made assistant general manager.

Fisher Electrical Works Moves—The Fisher Electrical Works, Detroit, Mich., manufacturer of the Fisher electrical starting and lighting system for Ford cars, is moving into its new plant, a two-story structure, 64

by 400 feet. The business of this concern has been consistently increasing for some time and the old quarters were inadequate for manufacturing purposes.

Michigan Crown Fender at Ypsilanti—The Michigan Crown Fender Co., manufacturer of motor car fenders and metal stampings, is to locate at Ypsilanti, Mich.

Peerless Declares Dividend—The Peerless Motor Car Co., Cleveland, O., has declared the usual quarterly dividend of 1% per cent on preferred stock, payable October 1.

Ship 1,455 Cadillacs—The Cadillac Motor Car Co., Detroit, Mich., shipped 1,455 cars during August and has shipped all told 1,854 of the new Cadillac models since their announcement.

Remy Branch at Atlanta—The Remy Electric Co., Anderson, Ind., has established a direct factory branch at Atlanta, Ga., where it has been represented in the past by Alexander Seewald.

Packard Building at Pittsburgh—Work has been begun on a three-story brick and stone building at Pittsburgh, Pa., to be occupied by the Packard Motor Car Co. It will cost \$300,000.

Continental May Buy Plant—It is possible that the Continental Motor Mfg. Co., Muskegon, Mich., will acquire the property of the P. J. Connell Co., in that city, and establish a drop forge steel plant.

Manley Goes West—N. G. Manley, manager of the Metz branch at Worcester, Mass., for the last 6 months, has been promoted and sent west to manage the new Metz branch opened recently at Omaha, Neb.

Rector Leaves Pierce-Arrow—H. B. Rector, San Francisco, Cal., has severed his connection with the Pierce-Arrow Pacific Sales Co., and has organized a company which will act as Marmon agents for this territory.

Rayner with Herff-Brooks—R. B. Rayner has been engaged by the Herff-Brooks Corp., Indianapolis, Ind., to call on the distributors in Missouri, Illinois and Indiana, to see just what sales are pending and to assist in closing them.

Shorter Day for Warner—The Warner Mfg. Co., Toledo, O., maker of motor car parts, will reduce its working hours to 48 a week in October, with no change in the weekly wage. This is being tried as an experiment.

Peerless Man Joins Brown—Walter G. Schmunk, manager of the retail department of the Peerless Motor Car Co., Cleveland, O., has resigned to take the position of general sales manager for the Brown Auto Carriage Co., of that city.

Chalmers August Shipments—August was one of the best business months in the history of the Chalmers Motor Co., Detroit, Mich. The value of the car shipped during the twenty-six working days was \$2,000,000. To August also goes the record, for the cars shipped during July and August totaled fifty-five more than the total number shipped during the first six months of the last fiscal year, that is from July to January. According to officers of the company the outlook is for a continued increase in business.

Republic Truck Adds—Ground was broken a few days ago for another factory addition by the Republic Motor Truck Co., Alma, Mich. It will be a one-story structure and have 35,000 square feet of floor space. The other buildings are under construction and,

all told, the plant will have 54,500 additional feet of floor space when the new structures are ready. Business is reported to be the best the company ever had.

Beltz Firestone St. Louis Manager.—E. H. Beltz has been appointed manager of the St. Louis branch of the Firestone Tire and Rubber Co., Akron, O.

Gilmore Goes to New York.—E. A. Gilmore, who had the Lewis and Allen cars in Boston for wholesale distribution in New England, has gone to New York to join the sales force of the Carl H. Page Co.

Dupont Co. Formed With Million Capital.—The Du Pont Co., New York, has filed a charter at Dover, Del., with a capital of \$1,000,000, to manufacture, sell, and deal in motor cars, trucks, etc. S. A. Anderson, J. F. Curen and S. B. Howard, New York City, are the incorporators.

Apperson Is Building.—It is announced by the Apperson Bros. Automobile Co., Kokomo, Ind., that work on an addition to one of its plants has been started. This will give the company an additional 150,000 feet of floor space, which is necessitated by increased production caused by increased demand for 1916 cars.

Cosgrove Goes to Pullman.—A. R. Cosgrove has been appointed sales manager of the Pullman Motor Car Co., York, Pa. He has had wide experience in the selling of cars and accessories, and up until his connection with the Pullman company was sales manager of the magnetic gear shift department of the Cutler Hammer Mfg. Co., Milwaukee, Wis.

Miller Tire at Atlanta.—The Miller Rubber Co., Akron, O., has opened a direct factory branch at Atlanta, Ga., which will facilitate shipments in handling the large volume of tire tube and accessory business, as well as relieve the stock conditions of many dealers, now operating without any assistance, in the way of quick-shipping facilities and the benefits from a direct factory branch.

Organize to Represent Studebaker.—The Baraboo Motor Car Co., Baraboo, Wis., has been organized by Orriel L. Philbrick and C. L. Roser to do a sales agency business and will have headquarters in the Prothero-McGinnis Co.'s garage at Baraboo. The garage is being enlarged and remodeled and repair shop facilities greatly extended. The new company will represent the Studebaker in several counties in western Wisconsin.

Weed Chains Assembled at York.—An assembling plant of the Weed Chain Co., Bridgeport, Conn., has been opened in York, Pa. Employment is given to about 60 men. The chains are manufactured by the Standard Chain Co., York, and instead of shipping them to Bridgeport, are assembled at the new factory. The plant will remain in operation for at least 6 months. The same assembling plant was in operation last year.

Clark Retires From Business.—Percival S. Clark, one of the veteran dealers at Providence, R. I., has retired from business and will devote his time to civil engineering and show matters. The Mitchell line that he has handled has gone to Walter R. Richards, long associated with him as a salesman. Mr. Clark will have charge of the annual motor show of the Rhode Island Dealers' Association which takes place early in the winter.

Louisville Dealer Retires.—Ira S. Bennett has retired as president of the Kentucky Automobile Co., Louisville, Ky., one of the pioneer motor car concerns of the South and agent for the Cadillac. He has been succeeded by Hubert Levy, who will be assisted by Charles New, who will hold the offices of secretary and treasurer. Mr. Levy formerly held those offices, while Mr. New had been a director without taking any active part in the management. A substan-

tial amount of the stock which had been owned by Mr. Barnett has been purchased by those now comprising the management.

Gray & Davis Dividends.—The directors of Gray & Davis, Inc., Boston, Mass., have declared the regular quarterly dividend of 1% per cent on preferred stock, payable October 1.

Wittstein Leaves Knox.—H. L. Wittstein, efficiency engineer of the Knox Motors Co., Springfield, Mass., has resigned to accept a position as assistant to the manager of the Standard Fuse Corp., Paulsboro, N. J.

Cole Assistant Engineer.—Arthur A. Bull, prominent among junior engineers of Great Britain, has been appointed as assistant to Charles S. Crawford, chief engineer of the Cole Motor Car Co., Indianapolis, Ind.

Will Repair Tires Free.—The Rattan Auto Tire Co., Decatur, Ill., announces that it will change tires on any car, at any place in Decatur in case of a puncture or blowout, without charge, as a form of advertising.

Ford Tractors in Canada.—Ford tractors are to be made by the Ford Motor Co. of Canada, Ltd. A plant to be devoted exclusively to this end of the Canadian company's business is to be erected soon. It will be of such size that ultimately from 5,000 to 10,000 men will be employed there.

Reo Declares Dividends.—In addition to the regular quarterly dividend of 2½ per cent, the Reo Motor Car Co., Lansing, Mich., will pay an extra cash dividend of 12½ per cent October 1, to stockholders of record September 30. The stockholders of the Reo Motor Truck Co. will be paid a cash dividend of 10 per cent on the same date.

Spark Plug Co. to Build.—The new spark plug industry of the National Service Corp. at Hummelstown, Pa., reports splendid progress to date in every department of its business. The stock subscription has gone far beyond the expectations, half of the allotment of \$10,000 for Hummelstown and vicinity having been taken up. The factory very shortly will be equipped to turn out complete plugs at the rate of at least 5,000 a day.

Hayes Wheel Takes Factories.—Negotiations practically were closed last week for locating in Anderson, Ind., a factory by the Hayes Wheel Co., Jackson, Mich., which also has taken over the plant of the St. Johns Table Co., St. Johns, Mich. The Anderson plant will occupy a two-story building owned by the Pioneer Pole and Shaft Co., and it is said that the new factory will employ from 80 to 120 men. The output of the factory, it is said, will be 25,000 sets of wheels per month.

Allen Motor Elects.—The annual stockholders' meeting of the Allen Motor Co., Findlay, O., was held last week at Fostoria, O. The following officers were re-elected: President, E. W. Allen; first vice-president, G. H. Baker; second vice-president and sales manager, J. E. Wright; treasurer and general manager, W. O. Allen; secretary, A. E. Wyant; general superintendent of factories, L. A. Sommer. The officers reported that a liberal dividend from the profits of 1915 had been declared. The company announces that it will build 10,000 cars in 1916.

Bell Motor Building.—Increased production and the demand for cars from its agents has caused the Bell Motor Car Co., York, Pa., to start work on the erection of a large addition to its plant. The building will be a one-story frame structure of the saw-tooth type, 80 feet by 60 feet in dimensions. It will be used as an assembling room and paint shop. The company's rapidly growing business has made it necessary to seek larger quarters and efforts are now being made to secure a site for the erection of a large modern daylight factory building. The present building is leased by the company. Work on the addition is being rushed and it is expected to

have it completed within 2 weeks. With this addition the company will have about 25,000 square feet of floor space in its factory.

Cleveland Tire & Rubber to Add.—The Cleveland Tire & Rubber Co., Cleveland, O., will erect a tire plant at Ashtabula, O.

Morton Truck Increases Capital.—The Morton Truck & Tractor Co., Harrisburg, Pa., has increased its capital stock from \$100,000 to \$1,000,000.

Spalding Manages St. Louis Packard.—Henry W. Spalding, formerly with the National Cash Register Co., has been appointed general manager of the Packard Missouri Motor Co., and took up his new duties at the St. Louis Packard office this week.

Join Thermoid Rubber.—R. W. Gillette, formerly sales representative of the Prest-O-Lite Co., Indianapolis, Ind., and E. A. Jacob, formerly sales representative for the Fisk Rubber Co., have both joined the sales force of the Thermoid Rubber Co., Chicago, Ill.

Norton Resigns from Case.—F. Lee Norton, vice-president and general manager of the J. I. Case T. M. Co., Racine, Wis., has resigned and will devote his time to the conduct of his stock farm at Racine. Frederick Robinson, vice-president, resigned a short time ago. Mr. Norton was associated with the company 26 years and it is stated that he retains his financial interest.

To Promote Dealers' Interest.—Articles of incorporation have been filed in the office of the clerk of Jefferson county, Ky., by the Auto Trade Association. The object of the association is to bring together in social intercourse the members of the trade in Louisville, to promote betterment of trade conditions, the introduction of new methods in business, the correction of abuses and the conservation of the trade.

Testing New Tractor.—A. J. and O. G. Patch, Oshkosh, Wis., for 10 years associated with the Rumely and Fairbanks-Morse interests as tractor designers, are making exhaustive practical tests of a new gas-kerosene tractor they have developed at the Dauber-Kratsch machine shops in Oshkosh. Among the many new features is a full electric lighting equipment, opening new possibilities in agriculture, such as night plowing and general haulage.

New Factory for Oakes.—The Oakes company, Indianapolis, Ind., maker of fans and horns, has purchased a new factory site at the hoosier metropolis, where three large factory buildings have been erected, increasing the capacity of the company to 2,000 fans a day. The new plant contains new machinery, several 46,000-pound presses, enameling ovens, etc. Several acres comprise the grounds, and private railroad switches have been built. The capitalization of the company has been increased by \$50,000.

Overland Builds at St. Paul.—The Willys-Overland Co. has erected a service station in St. Paul, Minn. Part of the structure will be utilized for warehouse purposes and offices. According to officials of the company, the work has already been started on the new building which will have a frontage of 461 feet and depth of 188 feet, 6 inches. The specifications call for a four-story and basement structure to be built of brick and steel and made fireproof throughout. It will contain approximately 10 acres of floor space.

Brookmire Pierce Oil Treasurer.—Announcement has been made that James H. Brookmire, St. Louis, Mo., has been elected treasurer of the Pierce Oil Corp., to succeed D. G. Boissevain, of New York. Mr. Brookmire will close his connections with the St. Louis brokerage firm, of which he is a member, as soon as possible and will establish an office under his new title in St. Louis. Though not a member of the

board of directors, he will be on the operating committee and will have virtual charge of the financial affairs of an oil corporation.

Big Ford Sign at Philadelphia—The Ford Motor Co., Philadelphia, Pa., is having a huge electric sign erected on the top of its building. The sign will be 30 by 42 feet, will cost \$3,000, and when illuminated will be visible for several miles.

McCord Buys Wyandotte Plant—The McCord Mfg. Co., Detroit, Mich., which makes the McCord radiators, McKim gaskets and other accessories, has purchased a plant at Wyandotte, Mich., and will make its gaskets there. At least 125 men will be employed.

Hollier Eight-Cylinder Size—The cylinder dimensions of the 1916 Hollier eight was given in the September 2 issue of Motor Age as being 3 by 3 1/4 inches. This should have been 3 by 4 1/4 inches. In describing the roadster the tire size was given as 33 by 3 1/2, but should have read 32 by 3 1/2 inches.

Double Shift for Axle Company—The Walker-Weiss Axle Co., Flint, Mich., which has been employing 350 men, is adding 200 to its force and is going to operate its plant night and day. Owing to the lack of houses in the city it has been difficult to get all the skilled workers needed as they generally look for good houses.

Chalmers Heads Banquet—Between 120 and 130 heads of departments, their assistants, foremen and others, all employed by the Chalmers Motor Co., Detroit, Mich., were entertained at a get-together dinner and entertainment last Saturday night by S. H. Humphrey, vice-president and works manager of the Chalmers company.

Body Company Gets Plant—The Detroit Weatherproof Body Co., Detroit, Mich., recently organized to make weatherproof tops for Ford and other cars, will occupy the plant formerly occupied by the Kemmeweld Can Co., which has been leased by the C. R. Wilson Body Co., with which the new concern is closely related. The plant contains about 80,000 square feet of floor space. A force of 400 to 500 men will be

employed. The Wilson company has secured an option to purchase the plant at a price said to be about \$100,000.

Reo Six \$1,250—In the September 9 issue of Motor Age the price of the Reo six for 1916 was given as \$1,150. It should have read \$1,250.

Vall Resigns from Maxwell—J. A. Vall, who has been chairman of the board of directors of the Maxwell Motor Co., Detroit, Mich., resigned last week, wishing to retire from business. No successor has been appointed to succeed Mr. Vall.

Briscoe to Locate in Pontiac—It is reported but not confirmed that Frank Briscoe is negotiating for one of the factory buildings making up the Flanders estate at Pontiac, Mich. It is said that Mr. Briscoe may start a new industry in the Michigan city.

Chicago Concern Locates in Holland—The Steelclad Auto Bow Co., a Chicago concern, will locate its plant in the Holland Mfg. Co.'s building, Holland, Mich. The company has a capital stock of \$50,000. The condition made to locate in Holland was that people of that city take \$15,000 worth of the preferred stock.

Prest-O-Lite Extends Line—The Prest-O-Lite Co., Indianapolis, Ind., has extended its line of battery business which it launched in last June by purchasing the Brown-Smith Battery Co., Bloomington, Ind., which concern has specialized in storage batteries for house lighting, a field that the Prest-O-Lite Co. has covered for many years with its gas-lighting systems.

New Concern at Detroit—The firm of Daly & Co. has been formed by W. L. Daly and J. G. Bayerline, at Detroit, Mich., Hammond building, to act as manufacturers and distributors' agents; also as special motor car advisors on commercial matters. Mr. Bayerline has been in the motor car business for the last 13 years, being president and general manager of the King Motor Car Co. during the last 3 years. Mr. Daly was sales manager of the King company during the last 3 years. The new firm has arranged for the exclusive sales in the United States of the American one-

man Ford tops made by the American Top Co., Jackson, Mich. The concern also handles crown fenders, streamline radiators, hoods, etc., for Ford cars.

Firestone Building at Kansas City—The Firestone Tire and Rubber Co. is building a structure at Kansas City, Mo., to be used as a branch house. It will cost \$200,000 and will be furnished and ready for occupancy April 1, 1916.

Franklin is Air-Cooled—In the September 2 issue of Motor Age the description of the Franklin for 1916 credited this car with a weight reduction through the use of aluminum water jackets. This clearly was an error as the Franklin is an air-cooled car.

Maxwells to Reach 60,000—Unofficial figures from the Maxwell Motor Car Co., Detroit, Mich., indicate that the factory will produce its scheduled number of cars this year, 60,000, despite the handicaps placed on all motor car manufacturers, the obtaining of raw material.

Kelly-Springfield Name Unchanged—Some confusion has arisen over the announced change in the corporate name of the Kelly Motor Truck Co. to the Sunset Motor Truck Co., as some believe this to be the Kelly-Springfield Motor Truck Co., Springfield, O. The latter has made no change in its name.

Emil Grossman Opens Chicago Branch—The Emil Grossman Mfg. Co., Inc., New York manufacturers of Red Head spark plugs and motor equipment, has leased the top floor of the building formerly occupied by the Winton Motor Car Co., at Chicago, to be used as its western manufacturing and distributing branch. The space occupied is 6,000 square feet.

Hudson to Add—The Hudson Motor Car Co., Detroit, Mich., recently purchased a piece of land, 500 by 380 feet, from the Anderson Forge and Machine Co. The property is located across the street from the present Hudson plant. A new engine-house and power plant will be erected on part of the land at once and later the construction of several large factory buildings similar to those of the present plant will be started.

New York—Standard Petroleum Products Corp.; motor car accessories; capital stock \$5,000; incorporators, William Sierks, Fred Hensler, Arthur Gutman.

New York—United Filling Stations; to operate gasoline filling stations, accessories, etc.; capital stock \$100,000; incorporators, Henry Waring, Daniel F. Delany and Clarence B. Tippet.

New York—United States Auto Service Corp.; garage business; capital stock \$50,000; incorporators, John DeBarbieri, John Condon, Leopold Ferger.

New York—Westchester Accessories Co.; motor car accessories; capital stock \$5,000; incorporators, C. H. Ludder, D. J. Wagner, Paul M. Pelletreau.

Owensboro, Ky.—Owensboro Motor Car Co.; motor cars; capital stock \$4,500; incorporators, O. C. Williams, Lee Hart, R. P. Keene.

Toledo, O.—Ohio Tire Service Co.; tire repair business; capital stock \$1,000; incorporators, George W. Henne, M. E. Hubbard, Samuel Love, Joseph M. Love and A. C. Moore.

Troy, N. Y.—Oldsmobile Distributing Co.; capital stock \$1,000; incorporators, George S. Bord, James N. Bussey, Helene B. Bussey.

Utica, N. Y.—Calder & Dyer; motor car business; capital stock \$3,000; incorporators, John W. Calder, Elbridge C. Dyer, S. S. Judson.

Waukegan, Ill.—Pearce Motor Co.; capital stock \$25,000; incorporators, Andrew Cooke, W. S. Pearce.

Westfield, Mass.—Westfield Mfg. Co.; motor vehicles; capital stock \$1,200,000; incorporators, Richard Mortimer, Samuel H. Wilde, R. B. Gregg.

White Plains, N. Y.—Kissel-Kar Garage Co.; capital stock \$5,000; incorporators, Elliott Stafford, H. R. Clark and P. W. Gaylor.

Wilson, N. C.—A. W. Abbott Co.; capital stock \$25,000; incorporators, A. W. Abbott, M. D. Abbott and George T. Burnett.

Youngstown, O.—Mutual Insurance Co.; to write motor car insurance; incorporators, B. E. Cornelius, C. A. Cochran, Phillip Wick, G. H. Kennedy and E. E. Dannison.

Recent Incorporations

Detroit, Mich.—Service Truck Co.; capital stock \$10,000; incorporators, Elbert H. Fowler, Katherine A. Warren and H. R. Stocpel.

Elmira, N. Y.—Interstate Pneumatic Valve Corp.; motor car accessories; capital stock \$5,000; incorporators, C. H. Thayer, Fred Peck, H. B. Peck.

Galesburg, Ill.—Allen Auto Sales Co.; incorporators, S. H. Walters, B. E. Hewitt and D. J. Hewitt.

Glen Cover, N. Y.—Pressed Bearing Co.; to manufacture bearings, tools, etc.; capital stock \$3,000; incorporators, Mortimer Schwager, Frank S. King, Arnold M. Schmidt.

Greenwich, Conn.—New England Motor Sales Co.; capital stock \$25,000; incorporators, C. Monteith Gilpin, Howard Pendleton and Effie C. Ort.

Katonah, N. Y.—Blue Book Garage; capital stock \$8,000; incorporators, Leslie J. Hayes, Sarah H. Hayes and James A. Benedict.

Lexington, Tenn.—Auto Sales Co.; motor cars; capital stock \$1,500; incorporators, J. A. Pope, Charles F. Rose, E. O. Tall and E. Jones.

Minneapolis, Minn.—Midgley Tire Sales Co.; capital stock \$50,000; incorporators, J. M. Harris, Jackson Carlisle, J. E. O'Brien, K. M. Harris.

New York—Pullman Motor Car Co.; capital stock \$10,000; incorporators, J. C. Cameron, Albert Frankel, D. A. Doyle.

New York—R. F. Renfro Co.; motor cars; capital stock \$15,000; incorporators, John P. Renfro, Alva Collins, James G. Gregg.

Augusta, Me.—Augusta Motor Co.; capital stock \$10,000; incorporators, James W. Skene, Irvin D. Fifield and Ralph Herrick.

Brooklyn—Brooklyn Tire Co.; to manufacture and deal in motor car accessories, tires, etc.; capital stock \$30,000; incorporators, W. L. Cahn, E. F. Quinn, M. DuFresne.

Brooklyn—Lexington Motors Brooklyn Co.; motor cars, etc.; capital stock \$1,000; incorporators, Joseph G. Stockham, Allen Black and Charles L. Apfel.

Buffalo, N. Y.—Berger & Deckop; garage; capital stock \$5,000; incorporators, Fred V. Berger, Charles J. Deckop, James A. Deckop.

Cadillac, Mich.—Cadillac Auto Truck Co.; capital stock \$100,000.

Chicago—Boulevard Tire & Supply Co.; capital stock \$10,000; incorporators, Jesse Spalding, Alfred T. Carton, Henry A. Gardner.

Cleveland, O.—R. & R. Valve & Motor Co.; to manufacture valves and motors; capital stock \$1,000; incorporators, H. A. Beckett, O. O. Vrooman, C. E. Meilen, H. L. Parmenter and F. A. White.

Cleveland, O.—Seattle Loxauto Mfg. Co.; to manufacture motor cars; capital stock \$50,000; incorporators, R. W. Dearmorn, H. J. Dearmorn and E. M. Cox.

Cleveland, O.—Superior-105 Garage Co.; capital stock \$10,000; incorporators, A. Frankel, W. C. Cole, H. Jones, Hazel Cole and Florence Frankel.

Dallas, Tex.—Ray Ross Automobile Co.; incorporators, E. H. Ray, E. W. Ross, J. V. Hardy.

Dayton, O.—Fire-Proof Garage Co.; capital stock \$10,000; incorporators, W. D. Huber, A. C. Huber, Annie E. Huber, Olive M. Swift and Julia Ann Keever.

Detroit, Mich.—Abbott Stamping Co.; to manufacture motor car license tags; incorporators, Charles S. Abbott, B. B. Bennett and F. B. Borlean.

Detroit, Mich.—Auto Service Mfg. Co.; capital stock \$1,000; incorporators, Edward E. Wasey, Clare L. Christie and John P. Nurdorfer.

New Garages, Repair Shops and Service Stations

ARKANSAS		
Town	Firm	Supplies
Little Rock	Buick Auto Co.	Repair
BRITISH COLUMBIA		
Vancouver	Begg Motor Co.	Tires
New Westminster	Fashion Garage	Garage
CALIFORNIA		
Colton	G. W. DeArmond	Garage
Los Angeles	Roddan-Latimer Sales Co.	Tires
DISTRICT OF COLUMBIA		
Washington	A. H. Aylor	Garage
FLORIDA		
West Palm Beach	Guy Whitting	Garage
GEORGIA		
Atlanta	A. C. Langston	Garage
Columbus	F. J. Dudley	Garage
ILLINOIS		
Aurora	Hobbs & Denney	Garage
Champaign	Harry Herrick	Garage
Lincoln	Barclay-DeLong Co.	Garage
Ottawa	Walter Mers	Service
Peoria	A. C. Lacey	Garage
Quincy	Bennett	Garage
Springfield	Goddard White Co.	Service

Town	Firm	Supplies
Aurora	Hobbs & Denney	Garage
Ridgeway	Cummins & Wenzel	Garage
Rockford	Barnes Automobile Co.	Service
Rock Island	Noack Motor Co.	Garage
Springfield	Goddard-White Co.	Service
INDIANA		
Indianapolis	Varney Elec. Supply Co.	Tires
KENTUCKY		
Louisville	Southern Motors Co.	Tires
Owensboro	J. F. Hayden	Garage
Versailles	John U. Fieldo	Garage
MARYLAND		
Baltimore	A. P. Moessinger	Service
Baltimore	G. E. Blaylock	Service
Baltimore	A. & H. Garage	Garage
MINNESOTA		
St. Paul	J. N. Johnson Co.	Service
Duluth	Joy Bros. Motor Car Co.	Garage
Duluth	Mutual Auto Co.	Garage
MISSISSIPPI		
Indianola	Safety First Auto Co.	Garage
NEBRASKA		
Omaha	King-Beldon	Garage

Town	Firm	Supplies
Mooresboro	Queen & Kanipe	Garage
PENNSYLVANIA		
Uniontown	Shaw Motor Co.	Garage
TEXAS		
Austin	B. W. Randolph	Garage
El Paso	Modern Auto Co.	Garage
Tahoka	Hall Robinson	Garage
Temple	H. B. Conlisk	Garage
WASHINGTON		
Spokane	Division St. Garage	Garage
WEST VIRGINIA		
Huntington	Fields & Ginn	Garage
WISCONSIN		
Milwaukee	L. Baum & Sons	Accessories
Sheboygan	Prange Motor Co.	Garage
Elkhorn	Smart Bros.	Garage
Kaukauna	William Van Lieshout	Garage
Milwaukee	Tiegs Bros.	Garage
Milwaukee	John G. Weldaeger Co.	Garage
Mineral Point	P. O. Vivian	Garage
Richmond	B. & W. Garage Co.	Garage
Wittenberg	W. R. Hirt	Garage

Recent Agencies Appointed by Motor Car Manufacturers

ALABAMA		
Montgomery	Abraham Bros. Motor Co.	Paige
Birmingham	Paige Sales Co.	Paige
ARIZONA		
Douglas	W. E. Tester	Maxwell
Globe	C. B. Brown	Maxwell
Kingman	M. G. Wagner	Maxwell
Nogales	Nogales Auto Co.	Maxwell
Phoenix	O'Neill Auto & Supply Co.	Maxwell
Prescott	Arthur Hendey	Maxwell
Tucson	James H. Hankins	Maxwell
Willcox	S. N. Holman	Maxwell
Winslow	Old Trails Garage	Maxwell

ARKANSAS		
Little Rock	The Bell Motor Car Co.	Paige
Ft. Smith	The Gardner Auto Co.	Paige

CALIFORNIA		
San Jose	Consolidated Garage Co.	Saxon
Los Angeles	C. S. Anthony	Gilde
Los Angeles	H. M. Zier	King
Alhambra	J. D. Meyer	Maxwell
Anaheim	Rockwell & Sidman	Packard
Bakersfield	Dollison & Louthain	Mitchell
Bakersfield	Dollison & Louthain	Stearns
Bakersfield	W. F. Gouty	Packard
Bishop	W. F. Hubbard	Maxwell
Colton	J. Z. Adamson	Maxwell
Covina	E. A. Poe	Maxwell
El Centro	A. L. Luce	Maxwell
Gardena	G. R. Young	Maxwell
Glendale	J. A. Pirtle	Maxwell
Hollywood	C. F. Little	Maxwell
Inglewood	W. S. Magee	Maxwell
Long Beach	Arthur E. Evans	Packard
Long Beach	Lawler & Begg	Maxwell
Lompoc	Collis & Nicol	Maxwell
Los Angeles	Carlton, Faulkner & Bowles	Maxwell

Los Angeles	Saxon Motor Sales Co.	Saxon
Monrovia	A. T. Badillo	Packard
Monrovia	O'Neal & Manning	Maxwell
Palms	John McCool	Maxwell
Paso Robles	R. E. Dalrymple	Maxwell
Pasadena	Grace Motor Car Co.	Maxwell
Pomona	E. E. Booth	Maxwell
Redlands	H. E. Ayres	Maxwell
Redlands	Hatfield & Ayres	Maxwell
Redlands	Crosson & Gibson	Studebaker
Rialto	J. M. Bradford	Maxwell
Riverside	Riverside Motor Car Co.	Packard
San Bernardino	Walter & Griemsmann	Maxwell
San Diego	Southwestern Motor Car Co.	Maxwell

San Francisco	Cuyler Lee	Maxwell
San Luis Obispo	C. H. Kamm	Packard
Santa Ana	Charles B. Perry	Maxwell
Santa Barbara	Oscar Fitch	Packard
Santa Barbara	E. J. Boeseke	Maxwell
Santa Monica	George C. Boehme	Maxwell
Santa Paula	I. B. Martin	Maxwell
Taft	Lierly & Son	Maxwell
Ventura	R. M. Seeley	Packard
Visalia	Charette Pennebaker	Dodge
Walnut Creek	A. N. Peterson	Oldsmobile
Whittier	W. J. Long	Maxwell

COLORADO		
Denver	Helser Bros.	Velle
Denver	L. M. Patrick	Lewis
Denver	Wilson Auto Co.	Chandler
Boulder	Hussie Auto Co.	Buick
Canon City	J. J. Armstrong & Son	Moon
Denver	W. F. Blaine	Case
Greeley	J. A. Nisbet	Scripps-Booth
Greeley	Foster Bros.	Chandler
Greeley	Ledgerwood Bros.	Monroe
Greeley	Ledgerwood Bros.	Monroe
Loveland	Straight & Son	Oldsmobile
Victor	Bonnell Motor Co.	Buick
Victor	Victor Auto Co.	Buick
Denver	Wilson Auto Co.	Empire
Denver	J. M. Patrick	Lewis
Denver	Wilson Auto Co.	National
Dolores	Helser Bros.	Velle
Durango	Dolores Motor Co.	Buick
Hartung	William Phelan	Buick
La Junta	La Junta Auto & Mach. Co.	Buick
Pagosa Springs	Fred Catchpole	Buick

Steamboat Spr'gs.	F. H. Metcalf	Buick
Walsenburg	Walsenburg Novelty Works	Buick

CONNECTICUT		
Baltimore	C. E. Trace	Standard
Bridgeport	W. J. Minty	Westcott
New Haven	N. B. Whitfield	Stearns

DISTRICT OF COLUMBIA		
Washington	Miller Bros. Auto & Supply	House
Washington	C. L. Burrows & Co.	Grant

FLORIDA		
Tampa	Westcott Motor Sales Co.	Westcott

FOREIGN		
Gautemala City	Stadeler & Co.	Hupmobile
London, S. W.	W. Turner Smith	Oldsmobile
Pekin, China	E. W. Fraser	Hupmobile

GEORGIA		
Americus	E. W. Tullis Auto Co.	Oldsmobile

IDAHO		
Albion	James H. Mahoney	Oldsmobile
Hayburn	F. H. Adams	Oldsmobile
Kellogg	A. P. Hutton	Paige
Troy	C. A. Johnson	Paige

ILLINOIS		
Northampton	F. W. Roberts	Stearns-Knight
Springfield	H. Britt	Stearns-Knight
Champaign	James Ewing	Westcott
Champaign	J. L. Wiese	Westcott
Alexis	W. A. Clark	Gilde
Albion	Reynolds & Fields	Maxwell
Aurora	Hobbs & Denney	Velle
Aurora	Hobbs & Denney	Hupmobile
Ashland	J. C. Votsmier	Moon
Beardstown	Ernest Fitzgerald	Dodge
Belvidere	Scripps & Jacobs	Hupmobile
Bloomington	F. G. Iseninger	Hupp
Chadwick	George Elyre	National
Champaign	Harry Herrick	Oldsmobile
Champaign	B. C. Nelson	Milburn
Chicago	McDuffee Auto Co.	Dort
Clinton	L. C. DeBoice	Moon
Decatur	George W. Ehrhart	Hupp
Durand	George Partch	Hupmobile
Freeport	Joseph Miller	Buick
Hillsboro	E. T. McDavid	Buick
Jacksonville	Jacobs & Meyer	Jeffrey
Latham	H. C. Klick	White
Macomb	O. P. Woodworth	Moon
Pekin	H. A. Reuling & Son	Davis
Rockford	Barnes Automobile Co.	Hupmobile
Rockford	Fred Carlson	Paige
Sheldon	W. L. McCloud	King
Shirley	Charles Hutchinson	Reo
Strawn	Stottler Bros.	Dodge
Washington	Zimmerman Bros.	King
Waukegan	Pearce Motor Co.	Ford
Weldon	M. H. Shinneman	Reo

INDIANA		
Fowler	Frank Shackleton	Oldsmobile
Ashley	J. E. Gage	Oldsmobile
Indianapolis	Higgins Motor Sales Co.	Saxon
Muncie	Stewart Bros.	Saxon
Huntington	Williston Auto Co.	Saxon
Indianapolis	Whitaker-Keeley Sales Co.	Dort
Ft. Wayne	Fuhrman Auto Co.	Dort
Richmond	J. F. Hornaday	Oldsmobile

IOWA		
Morning Sun	Fred C. Selzer	Gilde
Waterloo	Waterloo Auto Supply Co.	Gilde
Burlington	Cable Motor Car Co.	Westcott
Des Moines	Iowa Olds Mobile Co.	Westcott
Boone	J. H. Roberts	Oldsmobile
Bloomfield	Bruce-Bonar	Moon
Burlington	American Motor Sales Co.	Moon
Clinton	John L. Clark	Oldsmobile
Cresco	Pierce-Cunningham Automobile	Moon
Davenport	H. D. Rue	Ford
Des Moines	Guarantee Motors Co.	Kissel Kar

Des Moines	Holsman-Stevens Motor Car Co.	Dort
Des Moines	George Means	Moon
Ft. Dodge	Knight Motor Co.	Oldsmobile
Iowa City	S. A. Swisher & Son	Moon
Logan	Olson & Longman	Oldsmobile
Marshalltown	George Brown & Son	Oldsmobile
Maxwell	Braley & Allen	Oldsmobile
Newton	C. S. Weston & Co.	Oldsmobile
Osceola	E. W. Paul	Oldsmobile
Redfield	A. E. Smith	Hupp
Rippey	William Radebaugh	Oldsmobile
Tipton	A. V. Aker	Moon
Truro	Reed & Likens	Oldsmobile
Walnut	Robinson & Son Auto Co.	Oldsmobile
West Liberty	C. A. Waite	Moon
Moravia	Argo Brothers	King

KANSAS		
Bucklin	Thomas Cameron	Moon
Hoxie	Fred Andregg	Oldsmobile
Hutchinson	Taylor Motor Co.	Moon
Jemore	G. J. Hoff	Case
Iola	Oldsmobile & Saxon Sales Co.	Oldsmobile
Wichita	Callender-Cadillac Co.	Oldsmobile
Wichita	H. S. Lincoln	Moon

KENTUCKY		
Bagdad	H. L. Harrison & Son	Hupmobile
Bardstown	Grigsby & Son	Hupmobile
Cave City	Duke & Ferris Co.	Saxon
Canmer	Chas. Bale	Hupmobile
Covington	B. B. Hume	Hupp
Carlisle	Main Street Garage	Hupmobile
Clay	Clay Morot Car Repair Co.	Hupmobile

Danville	Mitchell & Shackelford	Hupmobile
Danville	A. E. Massey	Hupmobile
Danville	Reld & Lewis	Chalmers
Elizabethtown	J. H. Igleheart	Hupmobile
Elizabethtown	Jenkins, Essex Co.	Saxon
Eminence	Drane C. Bohannon	Saxon
Eminence	J. M. Miles & Son	Hupmobile
Eminence	D. L. Ricketts	King
Frankfort	Central Garage	Haynes
Georgetown	J. W. McMeekin, Jr.	Hupmobile
Greenville	Irvin & Gilman	Hupmobile
Greenville	Martin & Morgan	Hupmobile
Hartford	Cooper & Co.	Hupmobile
Horse Cave	Horse Cave Garage	Hupmobile
Henderson	White-King Motor Co.	Hupmobile
LaGrange	Yager Bros.	Hupmobile
Lawrenceburg	Woods-Ford Auto Co.	Chalmers
Lebanon	Ivo Canary	Haynes
Lexington	E. R. Aker	Haynes
Mayfield	H. M. Cousins	Hupmobile
Morganfield	Waller C. Wagg	King
Mt. Sterling	H. Clay McKee & Sons Co.	Hupmobile

Nicholasville	R. M. Sparks	Hupmobile
Owensboro	J. F. Hayden	Hupmobile
Owensboro	Rice Jesse	King
Paducah	McKnight-Gilson Auto Sales Co.	Hupmobile
Paducah	Park Garage	King
Shelbyville	Guy S. Wells & Son	Hupmobile
Simpsonville	Farmers' Supply Co.	Hupmobile
Standford	W. B. McKinney	King
Taylorville	Taylorville Garage	Hupmobile
Versailles	John U. Fieldo	Hupmobile
Williamsburg	H. B. Mahan	Overland
Winchester	Hagan & Walters	Hupmobile
Bowling Green	McElroy Page	Maxwell
Glasgow	Glasgow Motor Co.	Maxwell
Midway	Cogar-Rumley Co.	Maxwell
Hopkinsville	F. A. Yost & Co.	Maxwell
Sadleville	E. S. Baldwin	Maxwell
Richmond	Oldham & Harber	Maxwell
Frankfort	Nicol Garage	Maxwell
Stanford	H. C. Carpenter	Maxwell
Lancaster	W. D. Hammock	Maxwell
Salvisa	G. L. Alford	Maxwell
Danville	D. H. Prestitt	Maxwell
Lexington	Dew Hurst Garage	Maxwell
Cynthiana	W. M. Cox	Maxwell
Hawesville	C. Haynes	Maxwell
Maysville	Mike Brown	Maxwell
Wilmore	H. E. Fisher	Maxwell
Ashland	M. E. Marting	Maxwell
Lawrenceburg	J. P. McWilliams	Maxwell
Henderson	Park Garage Co.	Maxwell

Recent Agencies Appointed by Motor Car Manufacturers—Continued

Town	Agent	Make
Campbellsville	Buchanan-Lyons Co.	Maxwell
Paris	Craig-Davis	Maxwell
Madisonville	Neal Stivers	Maxwell
Owensboro	John W. Field	Maxwell
Hartford	Hartford Motor Co.	Maxwell
Marion	T. H. Cochran	Maxwell
Sturgis	J. M. Stone & Sons	Maxwell
Auburn	John D. Spears	Maxwell
Princeton	C. J. White & Sons	Maxwell
Caneville	Guy Willis	Maxwell
Lexington	Eluegras Auto Co.	Paige
Owensboro	Haynes Gordon Auto Co.	Paige

LOUISIANA

Eunice	F. J. Nacol	King
Monroe	J. Lowe	Paige
New Orleans	Herbert E. Woodward	Paige
Shreveport	Crawford, Jenkins & Booth	Paige
Alexandria	Mrs. W. Lennie-Smith	Paige
Echo	John Lacombe	King

MAINE

Bangor	Utterback-Gleason Co.	Dort
Portland	A. R. Darling	Oldsmobile
Portland	E. R. Benson Motor Car Co.	Studebaker

MARYLAND

Baltimore	Neely and Enser	Saxon
Baltimore	Randall Mfg. Co.	Bell
Baltimore	Co. Ridenow-Winterson Auto	Veile
Frederick	Mountain City Garage Co.	Paige

MASSACHUSETTS

Middletown	F. L. Caulkins	Dodge
	Erwin M. Jennings Co.	
Bridgeport	N. B. Whitfield	Crane-Simplex
New Haven	H. E. Bradford	Stearns
Waterbury	F. A. Hoar	Moline-Knight
Boston	John H. Stratton	Ford
Boston	Wentworth-Fosdick Co.	Dort
Colrain	Charles A. Marcy	Chandler
Milford	John H. Stratton	Ford
Milford	Turner-Ring Co.	Ford
Orange	Red Arrow Automobile Co.	Oldsmobile
Winchester	J. L. Symmes	Chandler
Winthrop	Winthrop Motor Sales Co.	Chandler
Woburn	W. H. Luck	Chandler
Worcester	Heavy Motor Car Co.	Dodge
Worcester	Worcester Reo Co.	Reo
Boston	M. F. Chase	Apperson

MICHIGAN

Galesburg	M. L. Miller	Chevrolet
Galesburg	H. C. Pfaff	Chevrolet
Easton	E. Wyckoff	Dodge
Beardstown	George W. Ehrhart	Hupmobile
Freeport	Floyd Izeminger	Hupmobile
Freeport	W. W. Holman	Reo
Galesburg	Thompson & Co.	Ford
Saybrook	Howard Zahn	Buick
Decatur	R. C. Ranken	Oakland
Bloomington	Imperial Garage	Chevrolet
Pontiac	Stephan & Kleckner	Buick
Stanford	Stephan & Kleckner	Chandler
Jacksonville	Stephan & Kleckner	Cadillac
Freeport	L. W. Cook	Mitchell
Bloomington	C. W. Frey	Stearns-Knight
Freeport	Frank Wilson	Oakland
Freeport	W. Cass Hamm	Haynes
Freeport	Hewitt & Walters	Allen
Decatur	E. D. Vanarsdell	Dodge
Bloomington	Penewitt & Cross	Saxon
Jacksonville	R. J. Von Fosson	Saxon
Jacksonville	C. H. Wright	Saxon
Saginaw	W. E. Hornung	Empire
Saginaw	Saginaw Cadillac Co.	Oldsmobile
Birmingham	Valentine & Smith	King
Sandusky	Hugh Woolman	King
Middleton	F. L. Reynolds and Fred	Dodge
	Boyard	
Marquette	Cloverland Auto Co.	Packard
Augres	W. H. Schabberger	Dort
Battle Creek	United Motors Co.	Dort
Bay City	Hartill Sales Co.	Dort
Beaverton	Ross & Heilmelboch	Dort
Beal City	J. Tilmann & Son	Dort
Charlevoix	A. L. Hart & Son	Haynes
Charlotte	Wilson Oakland Co.	Oakland
Crystal	Otis A. Sanford	Dort
Detroit	A. A. Crumley	Dort
Eaton Rapids	J. T. Hall & Son	Oldsmobile
Evart	Sandberg & Allison	Dort
Farmington	Park Garage	Dodge
Fostoria	Noah Tompkins & Son	Dort
Freehold	J. W. Bennett & Son	Empire
Grand Rapids	Oswald Motor Car & Supply	Co.
Howell	W. T. Armstrong	Dort
Ionia	Miller & Ashe	Dodge
Jackson	R. S. Howland	Dort
Kalamazoo	W. O. Harlow	Dort
Lapeer	S. W. Williams	Hollier
Marquette	W. L. Cosad	Dort
McBain	E. D. McDonald	Packard
Middleville	L. Mastenbrook	Dort
Morley	J. B. Pettie	Dort
New Lothrop	Poyer & Wood	Dort
North Star	F. N. Selby	Dort
Owosso	Owosso Auto Co.	Dort
Portland	Barton Bros.	Dort
Reed City	Sam T. Johnson	Ford
Three Rivers	C. C. Dougherty	Dort
Unionville	D. C. Brady	Dort

MINNESOTA

Dimondale	Edwards & North	Saxon
Colon	C. F. Hafer	Saxon
Lennon	Hoffner & Hammer	Saxon
St. Paul	Henry Bacon	Saxon
St. Paul	Pethander Sales Co.	Pathfinder
Hayfield	Louis Aarhus	Chevrolet
Austin	Loeb Bros.	King

Town	Agent	Make
Barrett	C. C. Peterson	Oldsmobile
Convick	Leslie Reimer	Ford
Lanesboro	Christianson & Lund	Dodge
Little Falls	F. J. Farrow	Maxwell
Minneapolis	L. Cross	Dort
Minneapolis	Moon Motor Sales Co.	Moon
Parkers Prairie	Sparks & Liljegen	Overland
St. Cloud	M. Bisenius	King
St. Paul	E. R. Boutell & Co.	Oldsmobile
Spring Valley	George H. Harris	Oldsmobile
Waseca	A. Guyer	King

MISSISSIPPI

Vicksburg	G. W. Miller	Oldsmobile
Vicksburg	Wright Bros.	Paige
Vicksburg	W. S. Shannon	King

MISSOURI

St. Louis	Frye Motor Car Co.	Saxon
Hannibal	E. C. Long Mfg. Co.	Westcott
St. Louis	Westcott Motor Sales Co.	
Desloge	Miller-Bryan	Westcott
Hannibal	E. C. Long	Moon

MONTANA

Corvallis	W. R. Myers	Saxon
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NEBRASKA

Hastings	Jones & Brandes Co.	Dodge
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NEW HAMPSHIRE

Lancaster	J. L. Bass	Chandler
Manchester	Packard Motor Car Co. of	
	Boston	Packard
Stratham	George F. Lord	Oldsmobile

NEW JERSEY

West New York	I. G. Miller	Bell
Camden	Lippincott Motor Co.	Moon
Trenton	Delmer Garage	King
Hillsdale	Chas. L. Van Wagonen	King

NEW MEXICO

Santa Fe	Modern Garage	Oldsmobile
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NEW YORK

Hudson	R. L. Andrews	Saxon
Kingston	Central Garage	Saxon
Mincola	Edwin M. Unser	Saxon
Rochester	Roy F. Snapp	Westcott
Albany	Utterback-Gleason Co.	Dort
Auburn	Charles A. Hadselle	Moon
Binghamton	New York Sales Co.	Dort
Brooklyn	Lexington Motors Brooklyn	
	Corp.	Lexington
Buffalo	Buse-Patten Motor Car Co.	Moon
Elmira	Davis & Roberts	Dort
Hudson Falls	Smith & McCoy Motor Co.	Oldsmobile
New York	E. J. Fireland	Dort
New York	Moon Motor Co.	Moon
Rochester	W. M. Kipp	Moon
Schenectady	Tooker's Garage	Oldsmobile
Watertown	Geo. H. Baltz	Dort
Watertown	Watertown Auto & Supply Co.	
White Plains	Tri-State Supply Co.	Oldsmobile
Wilson	Treichler & Housel Co.	Chandler
New York	Jos. Adler & Son	King
Kindershook	Geo. H. Brown & Bros.	King

NORTH DAKOTA

Oakes	J. W. Bush	Oldsmobile
Rollo	Dixon Bros.	Oldsmobile
Donnybrook	Aurelia Hdw. & Implt. Co.	Maxwell
Clyde	C. S. Dustin	Overland
Fullerton	F. W. Teichmann	Cornellian
Lisbon	Lisbon Auto Co.	King
Rhame	J. E. Nelson & Bro.	Oldsmobile

OHIO

Marion	F. D. Bentz	Interstate
Columbus	Saxon Motor Sales Co.	Saxon
Cleveland	Loveland Co.	Saxon
Wesleyville	West End Garage	Saxon
Akron	Westcott Motor Sales Co.	
Mansfield	Mansfield Motor Sales Co.	Westcott
Bellefontaine	Sparks Motor Co.	Westcott
Cleveland	Akron Westcott Sales Co.	Westcott
Louisville	Westcott Motor Sales Co.	Westcott
Canton	Quality Motor Co.	Moon
Cleveland	Ris Motor Car Co.	Dort
Columbus	Campbell-Fisher Sales Co.	Madison
Columbus	Central West Motor Co.	Oakland
Columbus	Central West Motor Co.	
Coshocton	J. W. Johnson	Buick
Findlay	Geo. W. Davis & Co.	Hupp
Mansfield	H. T. Manner	Metz
Newark	Andersen Motor Sales Co.	Empire
Tiffin	C. F. Pifer	Oldsmobile

OKLAHOMA

Frederick	F. W. Emenhiser	Hupp
Lawton	Maxwell Motor Car Corp.	Maxwell
Okarche	E. C. Loosen	Hupp

ONTARIO

Windsor	A. E. Thompson	Saxon
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PENNSYLVANIA

Tamaqua	B. A. Koppenhaver	Westcott
Johnstown	Hayes Auto Co.	Westcott
Harrisburg	Harrisburg Auto Sales & Dis.	
	tributing Co.	Bell
Parke	Clyde P. Grove	Bell
Dallastown	Ammon R. Smith	Bell
Wilkes-Barre	Carey Ave. Garage	Bell
Littlestown	L. M. Allemen	Bell
Philadelphia	W. W. Gawthrop	Bell
Butler	Citizens Motor Car Co.	Dort
Fayette City	J. P. Slotterbeck & Son	Dort
Gettysburg	Center Square Garage	Oldsmobile
Philadelphia	Baker-Bell Motor Co.	Oakland

Town	Agent	Make
Philadelphia	Lexington Motors Philadel.	Lexington
Philadelphia	N. Snellenburg & Co.	Pathfinder
Wilkes-Barre	G. S. Barnes	Moon
Wilkesburg	William L. Poffenberger	National
York	Snyder Auto Co.	Dort

RHODE ISLAND

Wellsville	Knight Automobile Co.	National
Providence	Walter R. Richards	Mitchell
Providence	Knight Automobile Co.	National
Providence	E. L. Neck	Moon
Providence	Paige Motor Co.	Paige

SOUTH DAKOTA

Groton	N. S. Bason	King
Bristol	McAllen & Knott Bros.	Ford
Bristol	McAllen & Knott Bros.	Overland
Clark	Harry Hurlbut	King
Deadwood	George H. Kilker	Hupp
Sioux Falls	Captain D. Jones	Moon
Sioux Falls	J. H. Kennedy	Oldsmobile

TENNESSEE

Calhoun	K. D. Saulpaw	Saxon
Knoxville	Frank A. Carpenter	Westcott
Memphis	Southern Auto Co.	Paige
Nashville	Nashville Motor Car Co.	Paige
Knoxville	Cadillac Sales Co.	Paige
Chattanooga	Chattanooga Auto Co.	Paige
Lawrenceburg	Lawrenceburg Motor Co.	Maxwell
Waverly	Middle Tennessee Auto Co.	
		Maxwell
Dickson	Standard Motor Co.	Maxwell
Murfreesboro	Elam & McCollough	Maxwell
Hartsville	C. A. Hammond	Maxwell
Franklin	Franklin Auto Co.	Maxwell
Portland	J. E. Kery & Sons	Maxwell
Memphis	Sam T. Harrison	Moon

TEXAS

Tell	Fox Bros.	King
Amarillo	E. A. Caldwell	King
Amarillo	Woldin Bros.	Franklin
Austin	Thomson Motor Car Co.	Hudson
Austin	Thomson Motor Car Co.	Dodge
Dallas	Davis Turney Auto Co.	Oldsmobile
Dallas	Ray Rose Automobile Co.	Saxon
Dallas	Rosenthal & Co.	Hudson
O'Donnell	Charles H. Doak	Dodge

UTAH

Salt Lake City	State Auto Co.	Saxon
Salt Lake City	King Auto Sales Co.	King
Salt Lake City	John N. Crosby	Maxwell
Salt Lake City	Randall-Dodd	National

VERMONT

Rutland	T. J. Byrne	Oldsmobile
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WASHINGTON

Seattle	F. H. Bardshor	Saxon
Iacoma	Coleman Bros.	Paige
Edwall	E. T. Lorable & Co.	Paige
Davenport	F. J. Walter Hainsworth	Oldsmobile
Seattle	J. C. C. Morris	Moon
Walla Walla	Snaveley	Overland
Waukon	C. M. Cedarbloom	King

WEST VIRGINIA

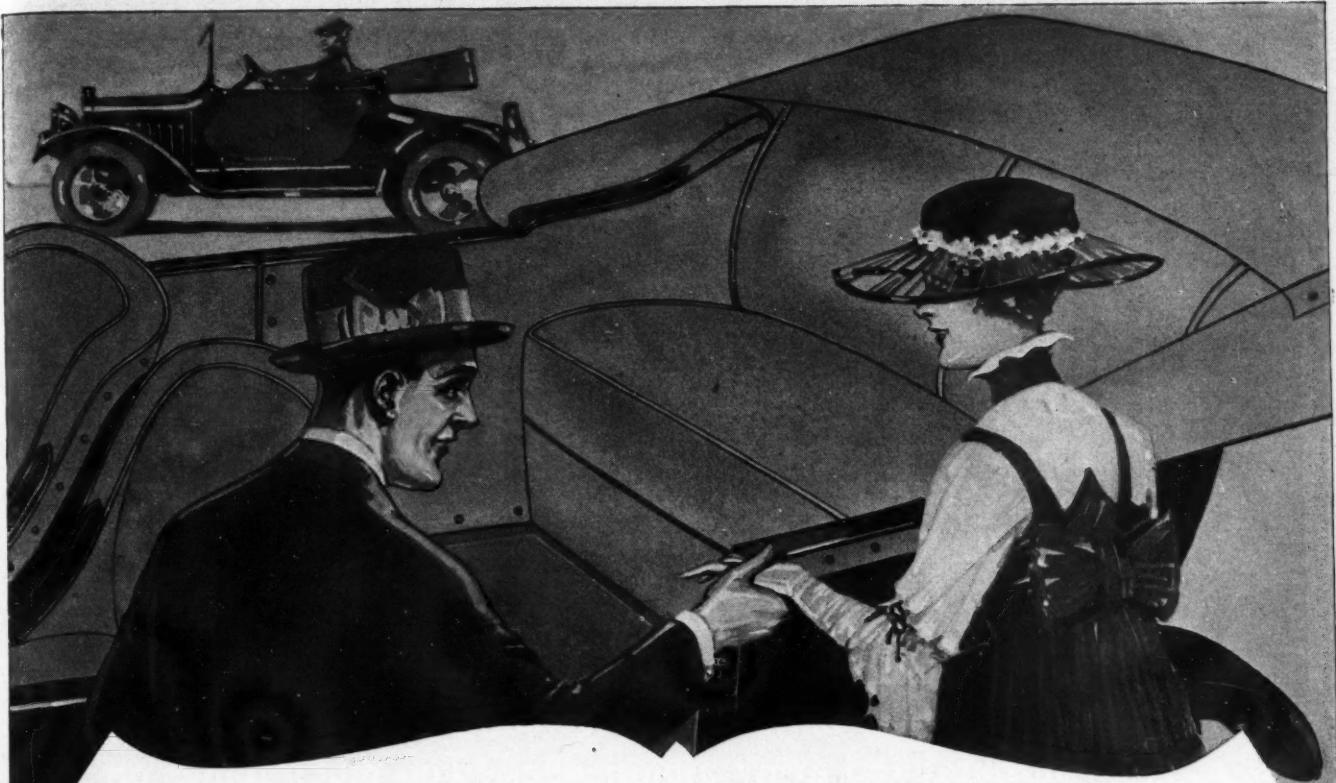
Mt. Hope	Jones & Bolen	King
Bayfield	D. B. Teter	Oldsmobile
Blaine	Appalachian Garage	Oldsmobile
Charleston	Virginia Elec. & Mach. Wks.	King
Grafton	Grafton Motor Co.	Oldsmobile
Keyser	M. R. Bell	Oldsmobile
Meadowbrook	O. Clousson	Moon
Mt. Vernon	W. J. Schleicher	Hupp
Morgantown	Seven Pines Garage	Oldsmobile
St. Marys	St. Marys Motor Co.	Oldsmobile

WISCONSIN

North Lancaster	J. Flesch & Son	Gilde
North Lancaster	W. A. Jerrett	Gilde
Wausau	F. Schubring	Gilde
Oconomowoc	Roy Welch	Oldsmobile
Green Bay	Saxon Motor Sales Co.	Saxon
Milwaukee	Milwaukee Motor Sales Co.	Princess
Milwaukee	Sherman	Jackson
Milwaukee	Wells Garage Co.	Hollier
Beloit	J. W. Menhall	Hollier
Baraboo	Baraboo Motor Car Co.	Studebaker
Platteville	The Eagle Garage	Dodge Bros.
Oconto	Hugo Linzelbach	Jeffery
Baraboo	Baraboo Motor Car Co.	Studebaker
Campbellsport	Glenn Hill	Chalmers
Clinton	A. C. McCommes	Chalmers
Columbus	Lien Garage	Chalmers
Cuba City	Fiedler & Jaunsell	Chalmers
Detroit	A. A. Crumley	King
Elkhorn	Smart Bros.	Ford
Eau Claire	Murphy & Costello	Velle
Eau Claire	Murphy & Costello	Allen
Eau Claire	Reo Sales Co.	Reo
Fox Lake	Murphy Garage	Chalmers
Janesville	Prielpuff & Conway	Chalmers
Keokuk	L. Rosenheimer	Chalmers
LaCrosse	Rybold & Weihaupt	Chalmers
Manitowish	L. J. Anderson Co.	Chalmers
Menomonie	L. Gordon	Oldsmobile
Montfort	Gold & DiVall	Gilde
Milwaukee	Collins Garage Co.	Westcott
Milwaukee	Lauson Salentine Co.	King
Milwaukee	Lauson Salentine Co.	Allen
Milwaukee	Wells Garage Co.	Hillier 8
Oconto	Henry Bradley	Studebaker
Sheboygan	E. & H. Motor Co.	Chalmers
Sheboygan	Prairie Motor Co.	Oldsmobile
Sheboygan	Prange Motor Co.	Chevrolet
Westfield	Schauer Bros.	Dort

WYOMING

Casper	N. J. Bingenheimer	Oldsmobile
Cheyenne	Plains Auto Co.	Buick
Lander	Barney Beard	Buick



Warner Upholstery Covers

YOU, too, will experience a thrill of real satisfaction when you see your car equipped with the beautifully fitting Warner Upholstery Covers. They add an air of luxury and refinement to a motor car which unmistakably identifies the owner's taste. Heretofore only the highest priced motor cars were equipped with upholstery covers, but you can now secure the high grade Warner covers for any model of any car at prices that will really surprise you. Approximately thirty per cent of the automobiles in use today are equipped with upholstery covers. Three-fourths of the cars sold the coming year will be equipped with them. Why? Because they have become an absolute necessity and economy. They prolong the life of expensive upholstery, keep it from looking worn and shabby and insure protection to delicate finery which has often been ruined by oil and grease

from the pores of even the highest grade leathers. They cover worn, shabby upholstery, restoring newness to the used car. No more sticky, unclean seats, but instead absolute cleanliness, immeasurably more comfort and a soft coziness that puts real joy into motoring.

Our fabrics are not chopped out but are patterned and tailored by skillful upholsterers in keeping with the highest standards of upholstery cover construction and are unquestionably the most luxurious and best fitting covers made today.

Take pride in the condition and appearance of your car—have it looking bright and clean. Protect delicate finery—save your high priced upholstery. Get interested in this great saving.

Consult your dealer. If he cannot supply you, write us direct, giving your dealer's name.

Dealers: Write for catalog, samples and discounts. They'll interest you—are Money Makers.

The Warner Auto Top Company

1638 Central Ave.,

Cincinnati, O.

(Makers of high grade Vehicle and Auto parts for 30 years)

SCHEBLER

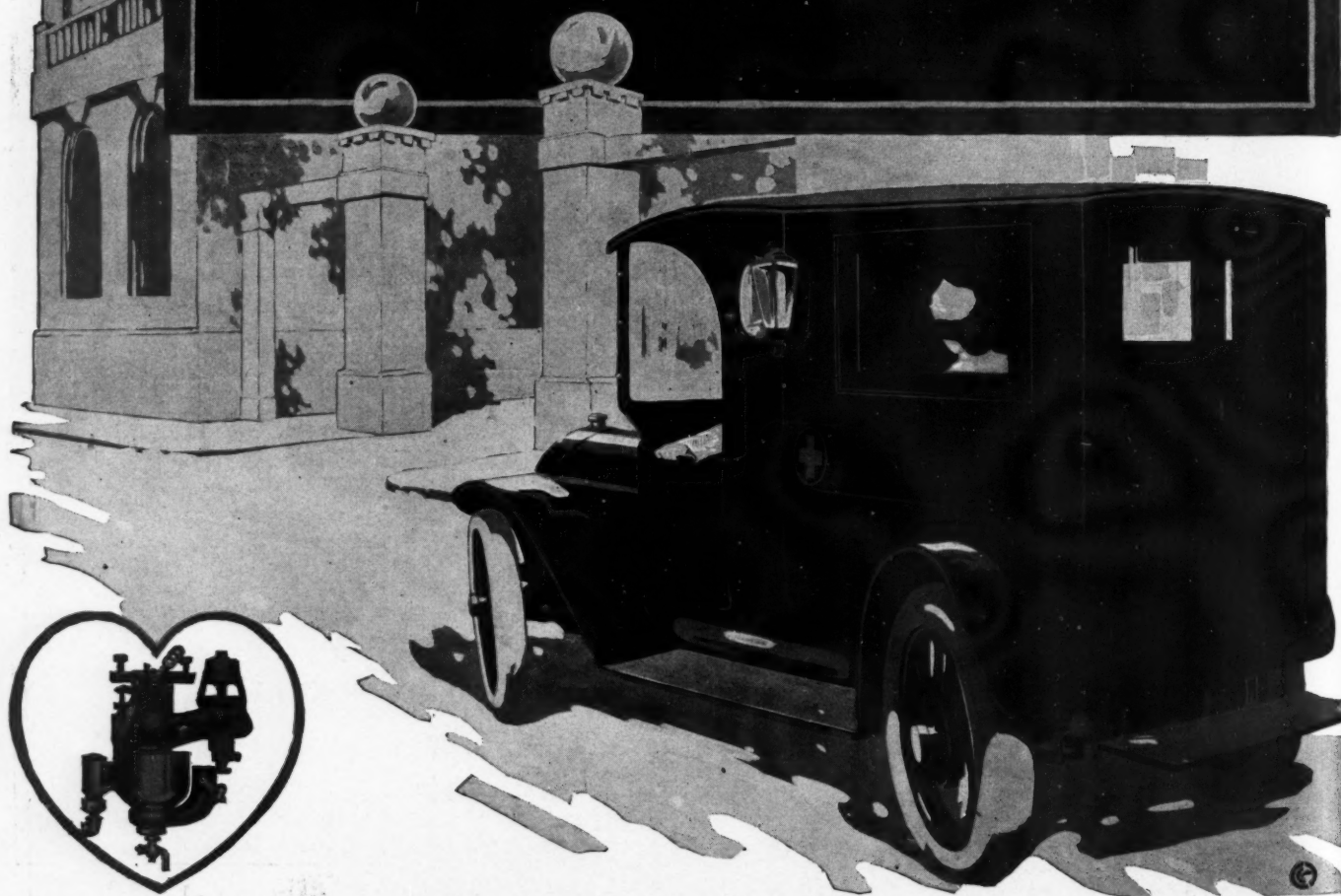
Servant to Humanity

Proud as SCHEBLER is of the world's records it holds for power, economy, flexibility and endurance, the SCHEBLER standard is topped by DEPENDABILITY.

The Dependable Carburetor

Dependability in emergencies has made SCHEBLER first choice of the leading manufacturers of police, hospital and army ambulances. Too much hangs on the fraction of a minute to run chances.

WHEELER & SCHEBLER INDIANAPOLIS
U. S. A.



When Writing to Advertisers, Please Mention Motor Age



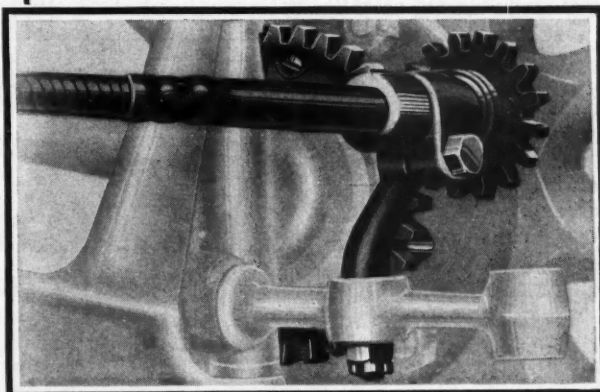
"Van"

The Speed-
meter with
the Big
Black Figures

Van's new front wheel drive keeps step with every move of your lively Ford.

You can't get ahead of Van—or behind him. He's "Built Like a Watch by Watch Makers"—accurate to the last degree.

Van and your Ford are a likely team, for efficiency.



Bracket Type
For Fords
\$12

THE VAN SICKLEN COMPANY

GENERAL OFFICES:
14 Chicago St., Elgin, Ill.

FACTORY:
Elgin National Watch Co.

Factory Representatives: Cutting, Armstrong & Smith Sales Co., Detroit, Mich., for the States of Michigan, Ohio and Indiana

General Distributors: The Beckley-Ralston Company, Chicago

Eastern Distributors: A. J. Picard & Co., 1722 Broadway, New York City

Foreign Distributors: Mestre & Blatge, 20 Store St., Tottenham Ct. Rd. W. C., London, England



MORE dissatisfaction results from doing business on a consignment basis than in any other way—disappointing to the manufacturer—disgusting to the dealer and disquieting to the user if he should find that either the manufacturer who made the goods or the dealer who sold them did not think enough of the quality of the goods to stand squarely on their feet and do business on a business basis.

RAYBESTOS is not—and never has been handled on consignment—not a foot of it.

The RAYBESTOS system of marketing through distributors—which are in effect direct factory branches—is infinitely more satisfactory, far more economical and in emergency more convenient to all concerned than any consignment arrangement could be.

RAYBESTOS in all sizes is carried in stock by some one hundred odd reputable concerns located in the various centers throughout the United

States and Canada, and each and every one of these distributors carries a stock of RAYBESTOS

adequate to meet trade demands. Each and every one of them can and will quote prices equally as favorable as the home office itself. They are prepared at all times to supply the trade

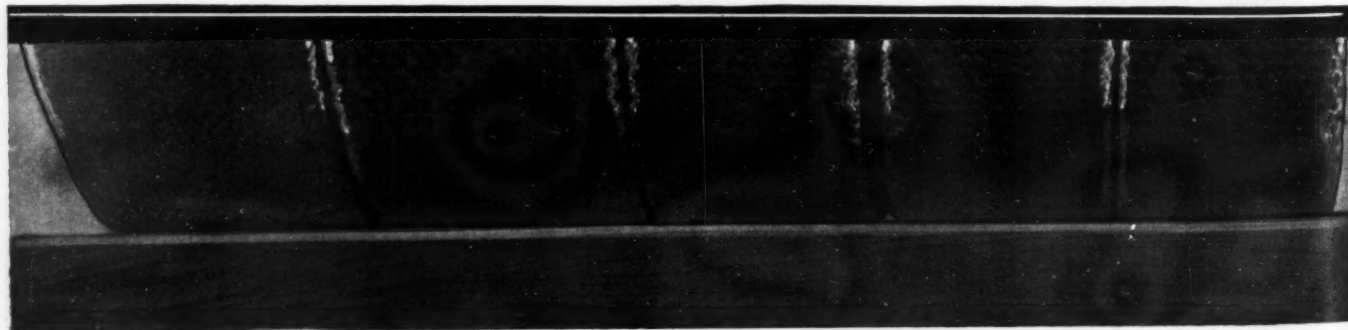
with any size, in any quantity, however large or small, and no dealer, garage man or repair man is so far removed from one of these distributors that he cannot send his order by telephone, telegraph or mail and have it filled over night.

TRADE MARK
Raybestos
REG. U.S. PAT. OFF.

THE ROYAL EQUIPMENT COMPANY

1352 Bostwick Avenue

Bridgeport, Connecticut



Announcement



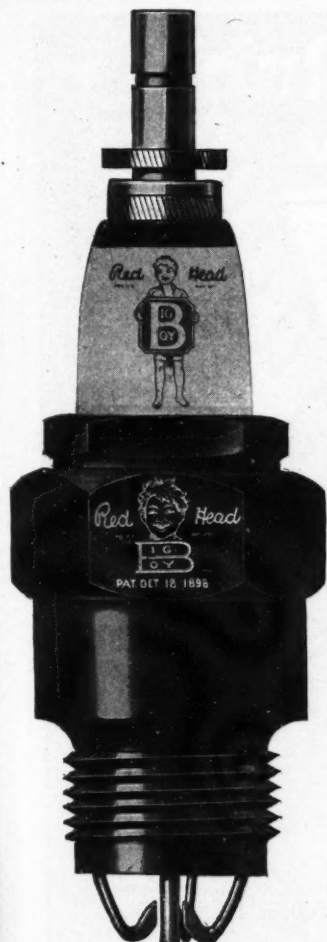
22-72 Series

A new series of Mercer cars, known as "22-72" models, will be ready for delivery early in November. The "22-72" Mercers succeed the famous "22-70" line, which have achieved such pronounced popularity during the past season.

Following the usual Mercer policy of building a highly developed, medium-weight, four-cylinder car of known quality, and concentrating on its production, this new series adheres closely to the design of the preceding models. Several improvements and refinements have been made, but there are no radical changes in either chassis or bodies.

nothing sensational

One of the Improvements—



Exclusive Equipment on 1916 Mercer Cars

There was the usual strenuous competition for the Mercer Co.'s plug contract—BIG BOY was selected strictly upon its merits—

Correctly Designed—
Carefully Manufactured—
Expressly Adapted to High-Powered Motors—

Guaranteed Forever

Emil Grossman M'f'g Co. Inc.

Bush Terminal (Model Factory No. 20), Brooklyn (New York City)

1253 Michigan Avenue,
Chicago

MESTRE & BLATGE, London, England,
Representatives in Great Britain

This Can Mean Much to You **CAR OWNER**

The announcement in MOTOR AGE and other publications that QUAKER TIRES can now be bought by car owners everywhere may be treated as an ordinary tire advertisement, or it can mean security, comfort and economy for you.

Welcome News to Many

To dealers and users in all parts of the United States, the story of QUAKER TIRES has been convincing, but even more so are mileage records of 8,000, 10,000, 12,000 miles and up, under all conditions of service, roads and weather.

Why not protect yourself, your car and your pocketbook by equipping your machine with "the logical tires?"

How to Get QUAKER TIRES

Likely a local dealer can supply you, but, if not, then order direct from the factory or the nearest distributing station. Factory inquiries should be addressed to Mr. Lyons.

This Ad. Appeared in the August 28 Issue

The Saturday Evening Post

TEMPERED Rubber Users Knew

Car owners who have been using these tires for more than *three* years were right when they told us, "All you need do is—let others know about them."

QUAKER
TRADE MARK REG. U.S. PAT. OFF.
Tempered Rubber
TIRES



Not until we had finished a big, new steel-and-concrete addition did we dare risk to "let others know." Now that we have, consumers and dealers everywhere are demanding QUAKER Tempered Rubber TIRES with their oil-resisting and shock-absorbing qualities; their excess mileage and freedom from tire troubles.

You can get QUAKER Tempered Rubber TIRES from your dealer—if not, then from our nearest dealer, branch or factory. Let us send you convincing proof from users.

DEALERS—There is still some good territory open, but *quick* action is necessary. Remember, ours is a "Square-Deal" policy. Better write or *wire*, TODAY.

QUAKER CITY RUBBER CO.

Factory and Home Office **PHILADELPHIA**

CHICAGO
182 W. Lake St.

PITTSBURGH
211 Wood St.

NEW YORK
207 Fulton St.

**Grip-Tite
No. 4827**

—the famous Grinnell Glove with the double corrugated palm, giving you a non-slip grasp on the steering wheel. Doubles the wear, too. No hand "skidding" with these gloves.



**Class,
Comfort and Service
Combined in These Motoring Gloves**

You are always properly gloved when you wear Grinnell Gloves. And what is just as important, your gloves, because of their many improvements—Grip-Tite, in particular—reduce the dangers of motoring. "Rist-Fit," "Limp-Kuff," "Grip-Tite" and "Ventilated Back" are features that do not cost you anything extra, but add greatly to the wear, and increase your personal comfort. You get them only on

Grinnell-Gloves

Best for every purpose

Grinnell Gloves have over 58 years of quality and fine workmanship behind every pair. They are made from soft, pliable Reindeer and velvety Coltskin, and wear like rawhide.

Besides the "Grip-Tite" feature, Grinnell Gloves have "Rist-Fit," giving a snug fit at the wrist! "Ventilated Back," evaporating perspiration and keeping the hands dry and clean.

Easily Washed

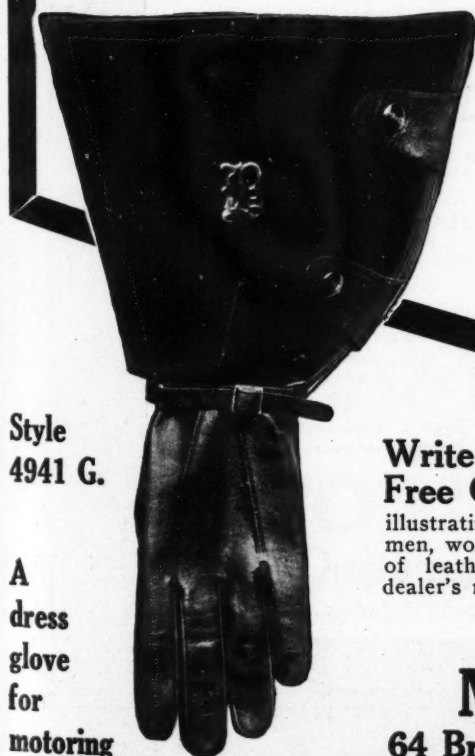
Wash Grinnell Gloves with soap and water, or gasoline, and when dry, they are as soft and smooth as the day you bought them. This is a convenience that will save you money.

Grinnell Guarantee

We guarantee Grinnell Gloves not to crack, harden, scuff or shrink.

Get a Pair on Approval

If your dealer does not carry Grinnell Gloves, send us his name and your size, and we will see that you have a pair for examination.



**Style
4941 G.**

A
dress
glove
for
motoring

**Write for
Free Glove Book**

illustrating the new glove styles for men, women and children, and samples of leather. No cost or obligation. Give dealer's name, please.

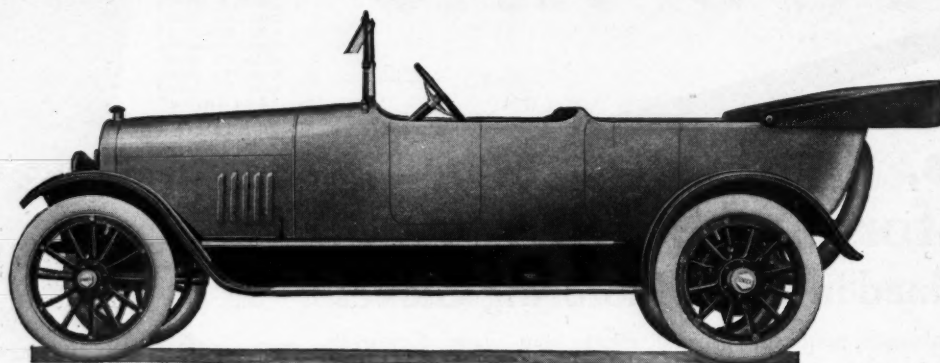
Morrison-Ricker Mfg. Company

64 Broad Street

Established 1856

Grinnell, Iowa

When Writing to Advertisers, Please Mention Motor Age



ENGER TWIN SIX

12 Cylinder

\$1095

—speaking of opportunity

Most of us do not recognize it when it comes. Others seem afraid—act timid.

But those with a real vision are the big automobile distributors of the day.

This is *your* chance.

A twelve cylinder car for \$1095!

Backed by a concern whom Dun and Bradstreet rate as \$1,000,000-AAA 1—the same as Packard and Ford.

Those dealers who connect with us this season are on the road to a great success.

Visit our factory. We want you to see this Twelve. We want you to drive it.

Come down and get acquainted.

This is your opportunity—*the first in years.*

Take it.

*Twin Six—12 Cylinders
2½" bore x 3½" stroke*

*Valve-in-head motor
Cantilever springs*

*115-inch wheelbase
Pure stream line body*

*Electric lights and starter
Complete in every respect*

Literature on request

The Enger Motor Car Co., Cincinnati, Ohio

Are You a Silver Tongued Orator?

IF you're not, why tackle the hopeless job of trying to sell your customers speedometers with obsolete, or untried principles, made up in an effort to meet our low \$12 price?

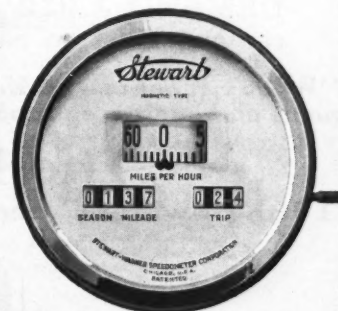
No manufacturer has anywhere near the production of the Stewart, and therefore none can possibly produce a really high-grade speedometer to sell at \$12.

In the Stewart you get not only the highest *Quality*, but we are able to back it with a costly *Advertising Campaign* and *Service* of 78 service stations distributed all over this country—all of which make the Stewart Speedometer for FORD Cars easier to sell than to compete with.

Stewart Speedometer
MAGNETIC TYPE
for FORD Cars - \$12

The Magnetic Type Speedometer costs more to make

Stewart-Warner Speedometer Corporation, Chicago, U. S. A.



Some automobile manufacturers believe in using the best of materials only. For that same reason

The Westcott Car

is one of the cars that are equipped with tops made exclusively of genuine Pantasote.

An automobile top that leaks is exasperating. You can always be protected against that kind of annoyance if you insist on and get a top made of

GENUINE Pantasote TOP MATERIAL

SHABBY TOP MATERIAL will spoil the entire appearance of any car. IN ADDITION TO BEING **GUARANTEED** not to leak, genuine Pantasote does not become shabby.

IT WILL WEAR FOR YEARS without becoming faded or permanently stained.

IT CAN BE CLEANED as easily as glass.

BY RETAINING ITS SPLENDID NEW APPEARANCE, it adds much to the general attractiveness of the car.

GENUINE PANTASOTE is not affected by extremes in temperature or climate.

YOU CAN USE IT ANYWHERE from the north pole to the equator, on a bone dry desert, or in the damp air of the seashore.

MOST OF THE BETTER CARS are being regularly equipped with tops made of genuine Pantasote material.

DEMAND A TOP made of genuine Pantasote when you select your car and insist on having it.

"What's What in Top Materials" explains the entire top material question. Your name and address on a postal brings this interesting and informative booklet free.

The Pantasote Company

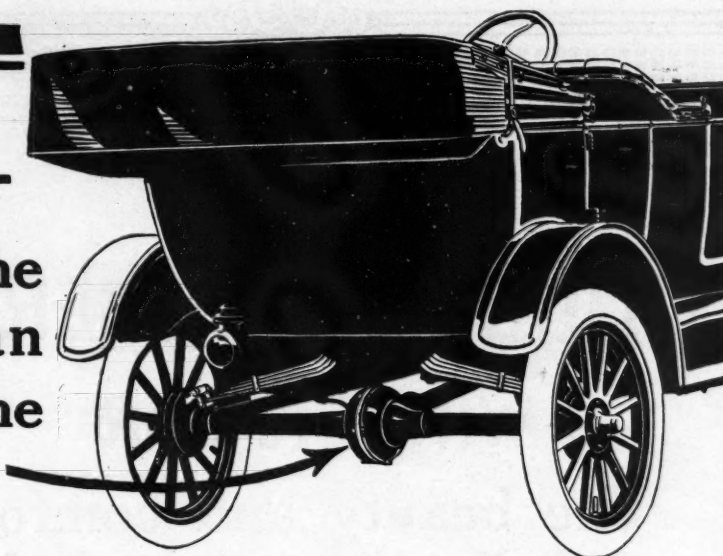
1705 Bowling Green Building

New York City



When Writing to Advertisers, Please Mention Motor Age

Honestly—
what does the
average man
know about the
differential?



M. & S. Gear Co.
Whitney Bldg.
Detroit

Without any obligation on my part, you may send me full particulars about the M. & S. Differential. I might be interested in

Installing in my car ☐

Agency proposition ☐

Check which might interest you.

I drive a.....car

Name.....

Address.....

He knows it's the device which makes it possible to turn a corner and that's about all. Does he know when his car is stuck in mud or sand that it's the fault of the old style bevel gear differential, which pulls only one wheel and allows the wheel having the least traction to spin?

Does he know that this unequal pull is the cause of rear tires wearing out because of "wheel spinning"? Does he know that the old type bevel gear differential is the cause of lost traction—and that loss of traction is the chief cause of "wheel skidding"—the start of the car skid?



U.S. Patents 1090082
Patents in all foreign countries. All improvements will be vigorously prosecuted.

Think of it—these are only three of the many "troubles" due to the old style differential — there are lots more — our booklet tells about them.

Engineers know the bevel gear differential is faulty, yet during all the years automobiles have been built, no great improvement has been made in the differential. Motors have been perfected—starters have been developed—electric lighting—oiling systems—carburetion—ignition and other important details have all received their share of development work. And now comes the greatest refinement of all—the perfected spiral gear

*The M. & S. is Standard
Equipment on the
Jeffery "Quad"*

M&S
DIFFERENTIAL

"Pulls Both Wheels"

*Special Type for Ford
Car—Fits the
Ford Housing*

that gives you an hitherto undreamt of control—a sense of security in driving and handling your car that is as noticeable as the flexibility between a multiple cylinder engine and a one-lunger.

Ford Owners Get "First Chance"

The Car Manufacturer can get M. & S. Differentials for equipment from the Brown-Lipe-Chapin Co. of Syracuse—the world's greatest manufacturer of differential gears. The fact that the Brown-Lipe-Chapin Co. has contracted for the American manufacturing rights is the biggest kind of endorsement for the M. & S.

But what about cars at present in use? We can't make M. & S. Differentials for all of them—not at present anyway. So first of all we have arranged to supply Ford owners.

Send in the coupon before you forget it and get our booklet telling all about this wonderful improvement in differential construction.

There's a great opportunity for dealers to sell M. & S. Differentials to Ford owners.

M. & S. GEAR CO., 1036-1042 Whitney Building, DETROIT

DISTRIBUTORS: M. & S. Sales Co., 429 So. Ervay St., Dallas, Texas; M. & S. Sales Co., S. E. Cor. Race and Broad St., Philadelphia, Pa.; Hill-Smith Metal Goods Co., 88 Pearl St., Boston, Mass.; M. & S. Sales Co., 936 Woodward Ave., Detroit, Mich.



DODGE BROTHERS

WINTER CAR

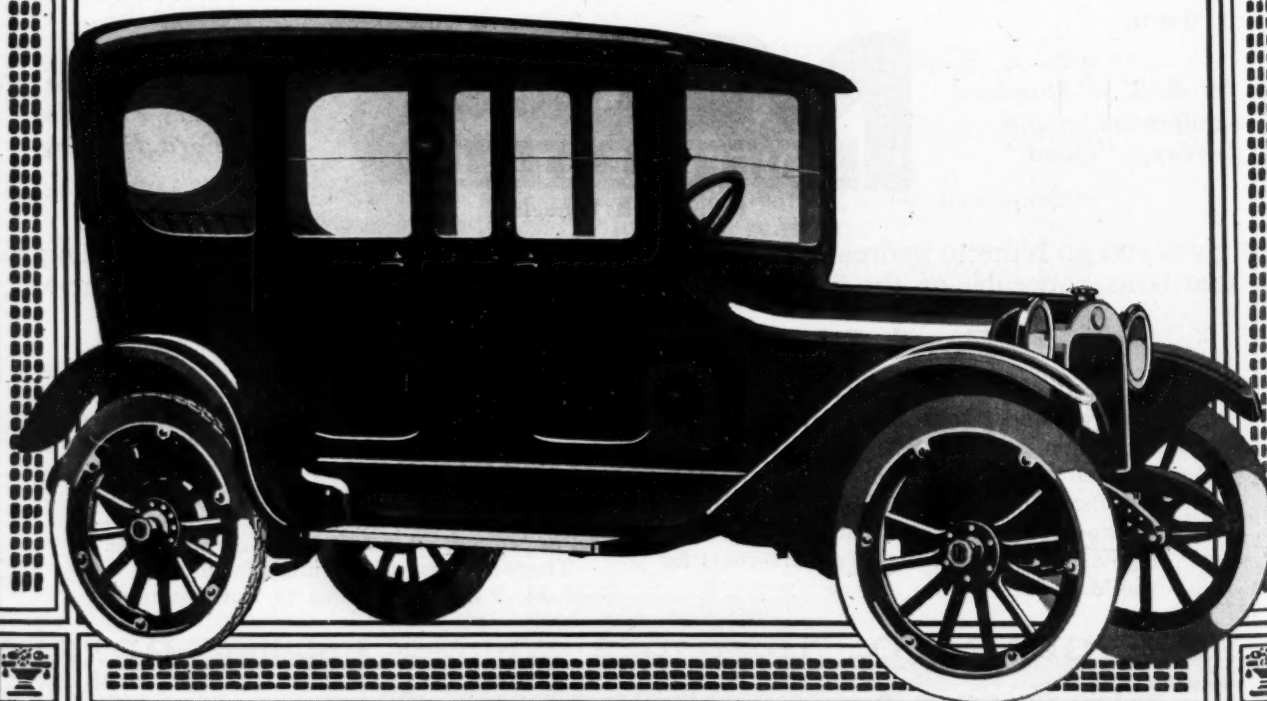
The beauty and comfort
and dignity you look for
in an enclosed car

The touring car and the roadster converted into Winter cars by means of demountable, electrically-lighted, cloth-upholstered tops. Designed and built especially for these cars—retaining and emphasizing the grace and beauty for which they are noted.

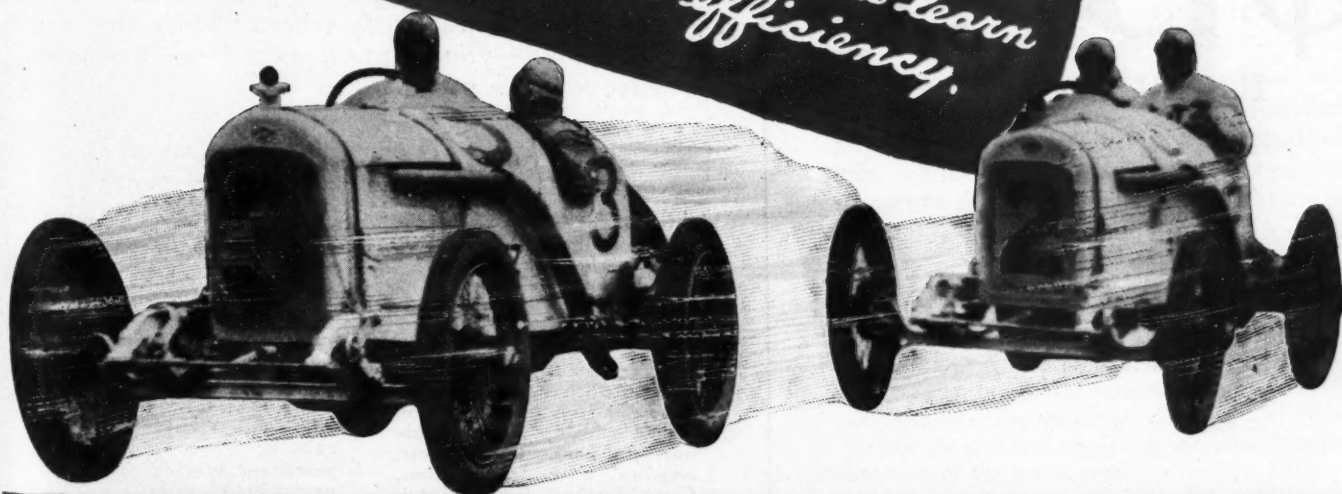
The motor is 30-35 horsepower
The price of the Winter Touring Car or
Roadster complete, including regular
mohair top, is \$950
(f. o. b. Detroit)

Canadian price \$1335 (add freight from Detroit)

DODGE BROTHERS, DETROIT



Stromberg
Equipped Stutz Cars Win
1st. and 2nd. Places in
500 Mile Minneapolis Race!
Another victory to Stromberg
credit - more proof of the new
 Stromberg Carburetor superiority
 in power, in speed, endurance
 and acceleration!
 Cooper won first place, averaging
 86.35 miles per hour, with Anderson
 just $\frac{1}{4}$ of a second behind - the
 closest finish in the history of
 auto races. And they never raised
their hoods!
 Send us name, year and model
 of your new or old car and learn
 how to increase its efficiency.



New STROMBERG Does it!
 CARBURETOR

Stromberg Motor Devices Co., Dept. G., 64 E. 25th St., Chicago, Ill.

When Writing to Advertisers, Please Mention Motor Age

Moline-Knight "40"



You Can Increase Your
Revenue by Selling This Car

\$1375

F. O. B. Factory

THE reduction in price is not accompanied by a reduction in quality. The identical steels, parts, fabrics, leathers, finish, etc., which have characterized our product in the past are used in this car. There has been no skimping.

Because—

Moline-Knight prestige is increasing wherever motor cars are driven—Moline-Knights have built an everlasting reputation—engineers admit that the sleeve valve motor as made in our plant is the "world's greatest motor"—the Knight sleeve valve motor has conclusively demonstrated its superiority with such vigor that critical buyers are now demanding this type of engine—there are men in your territory who will buy this car at \$1375—you cannot afford to lose the sleeve valve profits.

Specifications

Light weight — 2896 pounds
filled with gas, oil and water.
118 inch wheelbase.
3 3/4 inch bore.
5 inch stroke.
40 horsepower.
34x4 inch tires (non-skid rear).
Selective three speed transmission with center control, left hand drive. Transmission placed midship, with double universal connection between engine and transmission.
Cone leather faced clutch with cork inserts.

Dynamo with storage batteries.
Head lights equipped with dimmers.
Lubrication by force feed, gear driven pump.
Connecticut high tension ignition system.
Electrically lighted and started.
Worm and sector steering gear.
Floating spiral bevel gear rear axle.
5 passenger touring car and 2 passenger roadster.
Complete equipment.

Moline Automobile Company
East Moline, Ill., U. S. A.

When Writing to Advertisers, Please Mention Motor Age

Atwater Kent

Ignition

Owing to the fact that it is impossible to stop the motor in any position which will leave the ignition circuit closed, the Atwater Kent System is fundamentally safe, and no accessory safety devices are necessary to protect the battery. The current flows only during the brief instant of each spark and the ignition switch is practically useless except for stopping the car. In other words, it might be left in the "ON" position permanently without the slightest danger of draining the batteries.


The Atwater Kent principle is absolutely unique among ignition devices. Its success is certified by more than nine years of uninterrupted growth. It is in use to-day on upwards of 200,000 cars and is endorsed by more than 30 reputable manufacturers and over 10,000 dealers, garages and repairmen.

The Atwater Kent magneto replacement system can be easily installed in place of the magneto on any standard car. Thousands upon thousands of car owners realizing the benefits of Atwater Kent Ignition are installing this system on cars previously equipped with magnetos and other types of ignition.


Our special outfit for Fords deserves the investigation of every owner of this remarkable car, and the opportunities which it offers to dealers, garages and repairmen are attracting the attention of the entire trade.

If you are a car manufacturer, dealer or owner and are not fully posted regarding this wonderful system, by all means get in touch with us without further delay. You owe it to yourself to have our complete data on file.


Atwater Kent Mfg. Works
4934 Stenton Avenue, Philadelphia, U. S. A.




The lifter as it is pulled forward by the notched shaft does not touch the latch, and the contact points remain open.



The lifter, reaching the point where it rolls off the notched shaft is pulled back by the lifter spring, striking the latch as it returns.



The latch, being struck by the lifter, presses against the contact spring and closes the contact points for a brief instant, immediately opening after the lifter passes.



The latch and lifter, having returned to their original position, are ready for the next spark.

*To Dealers
How about it?*

When a Customer Asks Regarding Bearings

Do Timken Bearings help sell the car?

Hundreds of dealers say they do because the public knows and trusts them.

And the beauty of it is, argument on your part is unnecessary. They stand up in service at points where others wear out—the facts are known—that's all.

But sometimes a little more knowledge is helpful, and when it is, remember this—no exaggeration of Timken merits is needed.

The plain fact is that bearings are not built to do the work of the springs and the tires, but to eliminate friction.

In that work of eliminating friction they have to be installed at points where they get the force of bumps and shocks, heavy loads and savage end-thrust.

They do not save the axle spindle from the shocks and loads. It must be built to stand them.

But if the bearings can't stand them, too, they will go to pieces and the car owner foots the bill.

If the bearings wear loose in service you get wobbly wheels, shafts out of line, gears out of mesh, loss of power.

The reputation of Timken Bearings is due to the fact that they stand more load and end-thrust than others, wear more slowly and can be adjusted to correct wear when it does occur—while non-adjustable bearings must be replaced.

Every word of this is backed up by the extent to which Timken Bearings are used at the hard service points in hundreds of thousands of cars.

That's why you don't have to fall back on generalities. You can get "The Companies Timken Keeps" and see exactly what cars use Timken Bearings, just how many each uses, and just where they are in the car.

If you don't know, send for the booklet. You'll find it interesting.



THE TIMKEN ROLLER BEARING CO.
Canton, Ohio
THE TIMKEN - DETROIT AXLE CO.
Detroit, Mich.



TIMKEN

ROLLER BEARINGS



J. G. VINCENT
Vice-President of Engineering
Packard Motor Car Co.

A TWELVE-CYLINDER TRIBUTE—

based upon the findings of three years' actual service, is paid the Bijur by the man who evolved the "Twin-Six."

Bijur

The Bijur Motor Lighting Company,
Hoboken, N. J.

Gentlemen:—

No better evidence of our satisfaction with the performance of Bijur starting and lighting systems on Packard cars can be found than our action in selecting this system for the twelve-cylinder motor of the new Packard "Twin-Six."

This selection follows an extensive experience with this system, beginning with the Packard 2-38 model and continuing through the 3-38, 4-48 and 5-48 six-cylinder models. In adapting this equipment to the new "Twin-Six," only slight changes in form were necessary to accommodate the new conditions. These changes involved in no way the working parts

of the system, being confined merely to making the generator and motor cylindrical instead of rectangular.

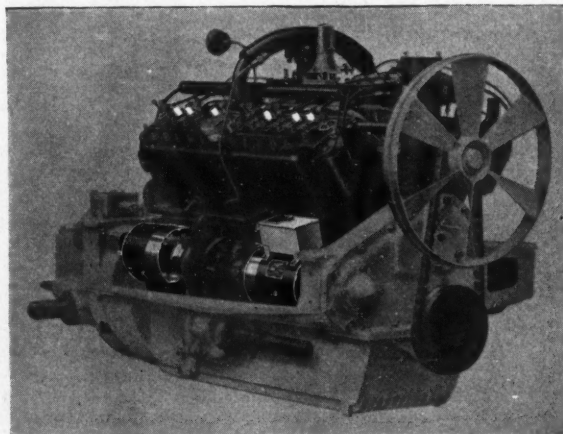
I may say that in continuing the Packard-Bijur system on the new "Twin-Six" models we feel that our selection not only proves the satisfactory service that the Bijur system has been giving us; but also that the very highest class of equipment has been chosen for the new twelve-cylinder motor.

Yours very truly,
PACKARD MOTOR CAR COMPANY

Vice-President of Engineering

The Packard "Twin-Six" twelve-cylinder motor, showing how the Bijur two-unit system of starting and lighting has been adapted to new requirements simply by making the generator and motor cylindrical instead of rectangular, the working parts remaining the same as on the six-cylinder Packards.

This view also shows the regulator on the generator, which, in the Packard-Bijur system, maintains a



constant voltage and through an automatic cut-out switch assures the proper relation of activity between the generator and the storage battery.



BIJUR EQUIPMENT, ADAPTED TO THEIR SPECIAL REQUIREMENTS, ALSO IS EMPLOYED ON WINTON, HUPMOBILE, SCRIPPS-BOOTH AND JEFFERY MOTOR CARS.

BIJUR MOTOR LIGHTING COMPANY, Hoboken, N. J.

Carspring BEST UNDER A CAR - BEST ON EARTH Tires

GARAGEMEN and DEALERS

Get in touch with the best tire proposition in the land. Do business the Carspring way and you will be TIRE headquarters in your section. Our distributing proposition is of the "live and let live" kind, such as you would expect from a manufacturer that has specialized in quality rubber goods for over fifty years.

Our policy is to select the best distributor, make him a member of the great Carspring family and extend the personal service and co-operation necessary to assure a permanent and profitable connection.

Best of all is the tire itself—it's as good as it looks, and on looks alone it would be selected in any competition. Each Carspring tire must necessarily be of super quality, for we shall never consider great quantity production to meet a demand. Rather, we shall adhere to quality—plus—to meet the conditions of service. Where other tires are of material and construction to deliver certain mileage, or make adjustment, we can and do deliver from one to three thousand miles extra service. That's the reason Carspring sales have jumped 300% in twelve months.

On the basis that all great rubber manufacturers have the same facilities for buying rubber and equal facilities for manufacturing, there would still be from 30 to 50 years' credit experience in Carspring favor. Carsprings ought to be best—and THEY ARE.

Show us that you are in business and we will show you the way to bring in hundreds of new customers.

New Jersey Car Spring & Rubber Co.

Established 1857

Jersey City

N. J.



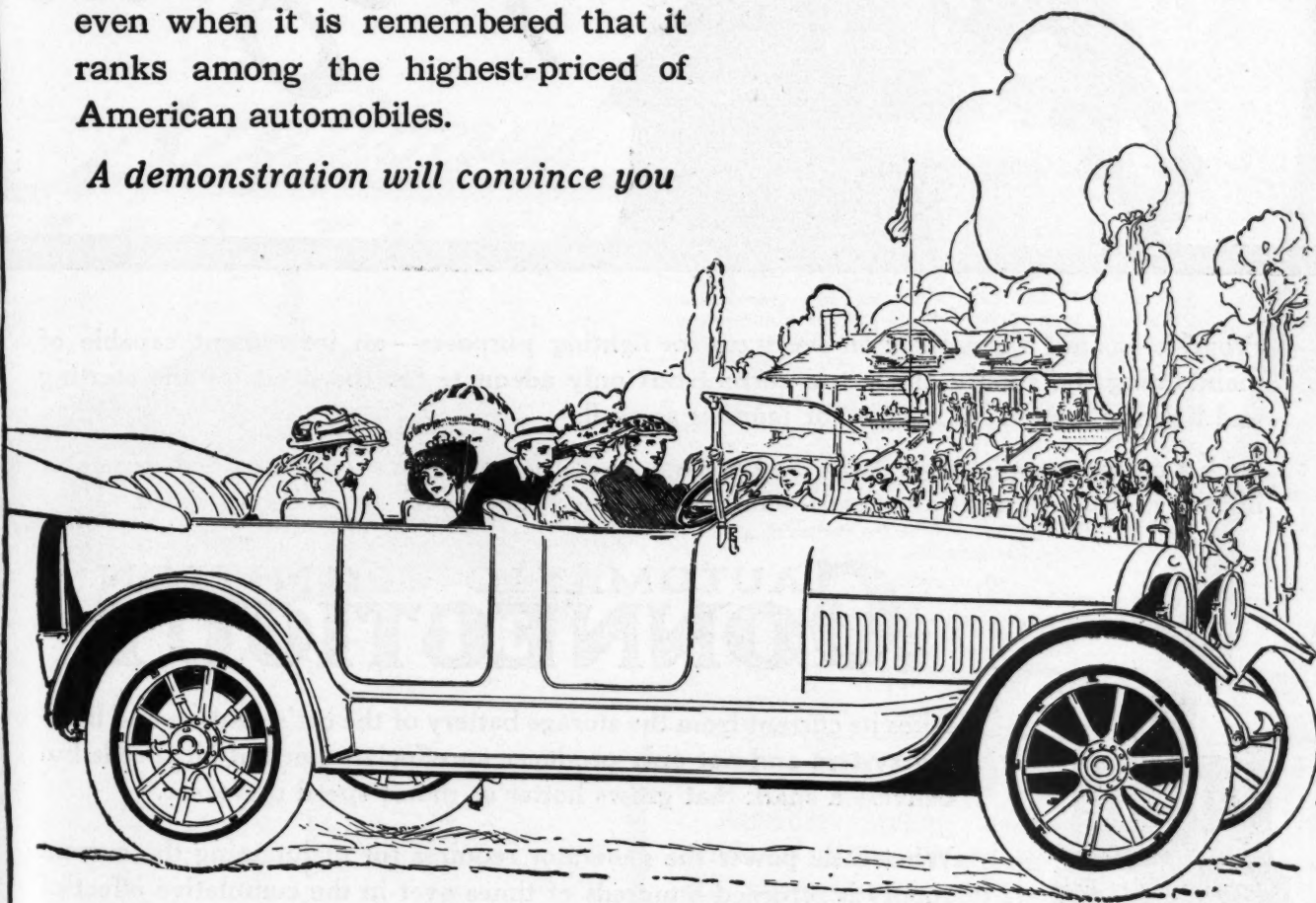
MARMON '41'

THE Marmon car is the product of peculiar engineering genius coupled with a care and patience in construction practically unrivalled in American motor building.

The Marmon car meets the fundamental demand of mechanical efficiency and dependability in a measure that has made it a marvel even when it is remembered that it ranks among the highest-priced of American automobiles.

A demonstration will convince you

*The Easiest Riding
Car in the World*



NORDYKE & MARMON COMPANY

INDIANAPOLIS INDIANA

"Over Sixty Years of Successful Manufacturing"



Progress

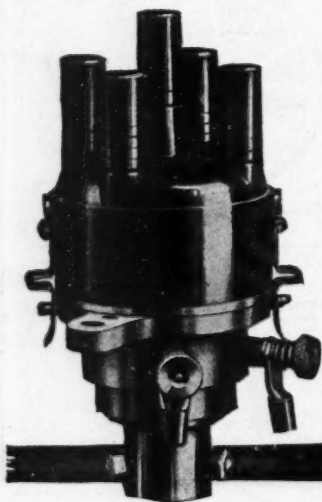
Progress has put a generator on every car for lighting purposes—an instrument capable of maintaining the supply of electric current not only adequate for the needs of the starting and lighting system but ample for ignition as well.

Such a current supply has a decided advantage over the magneto's self-contained generator in that it is constant at all speeds—the magneto's supply varies according to speed.

AUTOMATIC · IGNITION CONNECTICUT

takes its current from the storage battery of the car's starting and lighting system and not only produces an effective spark at all speeds but delivers a spark that grows hotter as motor speed decreases.

What little power the generator requires for maintaining the current supply is returned hundreds of times over in the cumulative effect of more powerful explosions resulting from more effective sparks.



CONNECTICUT **TELEPHONE & ELECTRIC** **CO., Inc., Meriden, Conn.**

Ford Dealers—Write for information regarding Connecticut Automatic Ignition for Ford Cars—
A. J. Picard & Co., Sole Agents, 1720 Broadway, N. Y.



Do Not Use Cheap Inner Tubes

IF every car owner could be made to realize the importance of the advice offered by MOTOR PRINT we wouldn't have to advertise National Tubes.

¶ **MORE TIRES ARE RUINED THROUGH THE USE OF CHEAP, FAULTY, POROUS TUBES THAN THROUGH ANY OTHER CAUSE.** There is no economy in trying to save 50c on a tube at the expense of a costly casing.

¶ National tubes are built entirely by hand of Up-River Fine Para Rubber throughout. In place of using but one thick sheet of rubber, rolled on a tube and then vulcanized, we use many thin sheets—to eliminate the tiny flaws and air pockets and to make the tube non-porous. As for the valve patch, there is no valve patch. The valve base is vulcanized INTO the tube as an integral part. It cannot possibly cause trouble. It is the strongest part of the tube.

¶ But it is not alone fine stock and more careful manufacturing methods that make National Tubes distinctly better than most tubes. Our method of treating the raw rubber, of slow loft-drying it for four weeks, our carefully guarded formula for compounding it, our special process of curing it, all help to make National Tubes tougher, more enduring and less subject to deterioration than other tubes.

¶ Avoid the constant annoyance and expense of cheap faulty tubes by equipping your tires with National Special Red Tubes. **GUARANTEED NON-POROUS AND PROOF AGAINST DETERIORATION FOR ONE FULL YEAR.**

National Rubber Company

Factories and Main Offices,

Pottstown Pa.

NEW YORK

J-M Shock Absorber Company

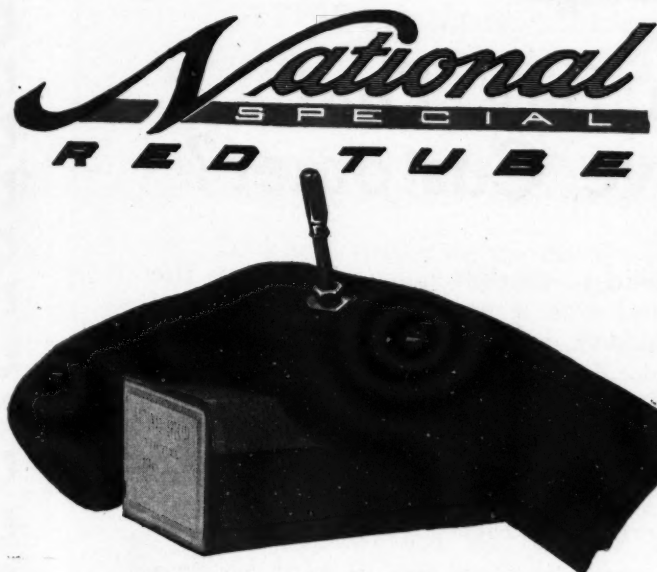
250 West 54th St.

PHILADELPHIA

J-M Shock Absorber Company

210 South 17th St.

From "Motor Print."



Size	Price	Size	Price
28x3.....	\$3.10	36x4.....	5.90
30x3.....	3.20	37x4.....	6.10
30x3 1/2.....	4.10	34x4 1/2.....	7.10
31x3 1/2.....	4.25	35x4 1/2.....	7.25
32x3 1/2.....	4.40	36x4 1/2.....	7.50
34x3 1/2.....	4.70	37x4 1/2.....	7.75
36x3 1/2.....	5.00	38x5.....	8.50
31x4.....	5.20	36x5.....	8.70
32x4.....	5.30	37x5.....	9.00
33x4.....	5.50	39x5.....	9.50
34x4.....	5.65	37x5 1/2.....	10.80
35x4.....	5.75	38x5 1/2.....	10.50

Another strong recommendation is made to relieve strain on the casings under all pressure conditions: **Do not use cheap inner tubes.** These are usually porous and allow a regular seepage of air. This causes damage both to tube and casing.



Would You Say That to a Prospective Customer?

Hardly!

But a thoughtless car-builder said to us that he wouldn't pay the price of Willard quality—all he wanted was a battery that was "good enough to run the car out of the dealer's show room."

True, he was an exception to the rule, for over 85% of all builders of electrically equipped cars—143 of them—have more regard for their dealer's interests.

Who gets the blame if plates go to pieces because they don't have enough anti-mony and their oxides aren't carefully selected as they are in Willard plates?

Who takes the kicks when lights are weak and starter won't work because terminals and connectors aren't heavy and strong enough to transmit all the current?

When 143 car-builders could buy cheap batteries yet continue to contract for Willards, there can be only one reason.

They agree with us and with their dealers that satisfied customers are worth more than saving a few cents here and there on the cost of a battery.

Cheapening any one of a score of big and little things in battery building—or careless inspecting and testing—may lead directly to short-circuits, acid-spilling, stalled engines, dim lights and great dissatisfaction.

Do you want to know what the real points of battery quality are? We can tell you how to make sure of them.

Send for Bulletin R-8 and get "Truth Telling Tests" and "Your Storage Battery, What It Is and How to Get the Most Out of It."

Willard Storage Battery Company Cleveland, Ohio

New York: 228-230 W. 58th St.
Chicago: 2524-30 So. Wabash Ave.

Indianapolis: 318 North Illinois St.

Detroit: 736-40 Woodward Ave.
San Francisco: 1433 Bush Street

Sole European Representative: The
British Willard Battery Co., Ltd.,
46 Poland St., London, W., England

Direct Factory Representatives In:
Philadelphia, Boston, Atlanta, Dallas,
Kansas City, Omaha, Minneapolis

Service Stations in All the Principal Cities in the United States, Canada and Mexico

RAYFIELD

CARBURETORS

Give the Rayfield Credit!

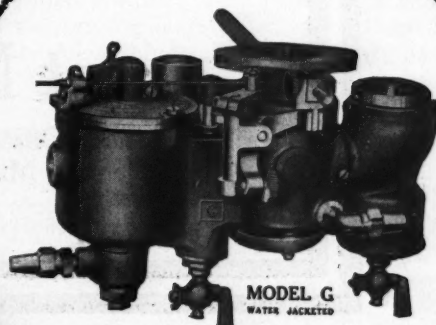
- ✓ To know that your motor won't choke in a moment of danger—
- ✓ To journey across any country, certain that no hill or sand can challenge the clean, instant, perfect mixture the RAYFIELD feeds your cylinders—
- ✓ To open the cut-out on a straight road and hear the snapping, sharp explosions of the RAYFIELD-fed motor—
- ✓ To realize that your RAYFIELD lets you throttle to a walk in traffic and speed forward instantly, without faltering—
- ✓ To know that you are always ready with speed and power for any emergency; and to travel with unsurpassed gasoline economy—

These are some of the reasons why the RAYFIELD dominates. They mean safety, comfort, satisfaction. They explain why no motorist ever changes from a RAYFIELD.

To motorists—try the RAYFIELD. To dealers:—make sure you understand fully how much the Rayfield adds to any car.

Findeisen & Kropf Mfg. Company
2109 Rockwell Street, Chicago, Ill.

1140 Michigan Avenue, Chicago, Illinois
1902 Broadway, New York City, N. Y.
1214 Woodward Avenue, Detroit, Mich.





TRANSMISSIONS

RIGHT { Design
Material
Workmanship

have made their impression on automobile designers and engineers with the result that

Covert Transmissions

are specified for pleasure cars and motor trucks by noted men of the automobile industry.

This recognition of true merit is the result of fifteen years of specializing in the production of trouble-free transmission units.

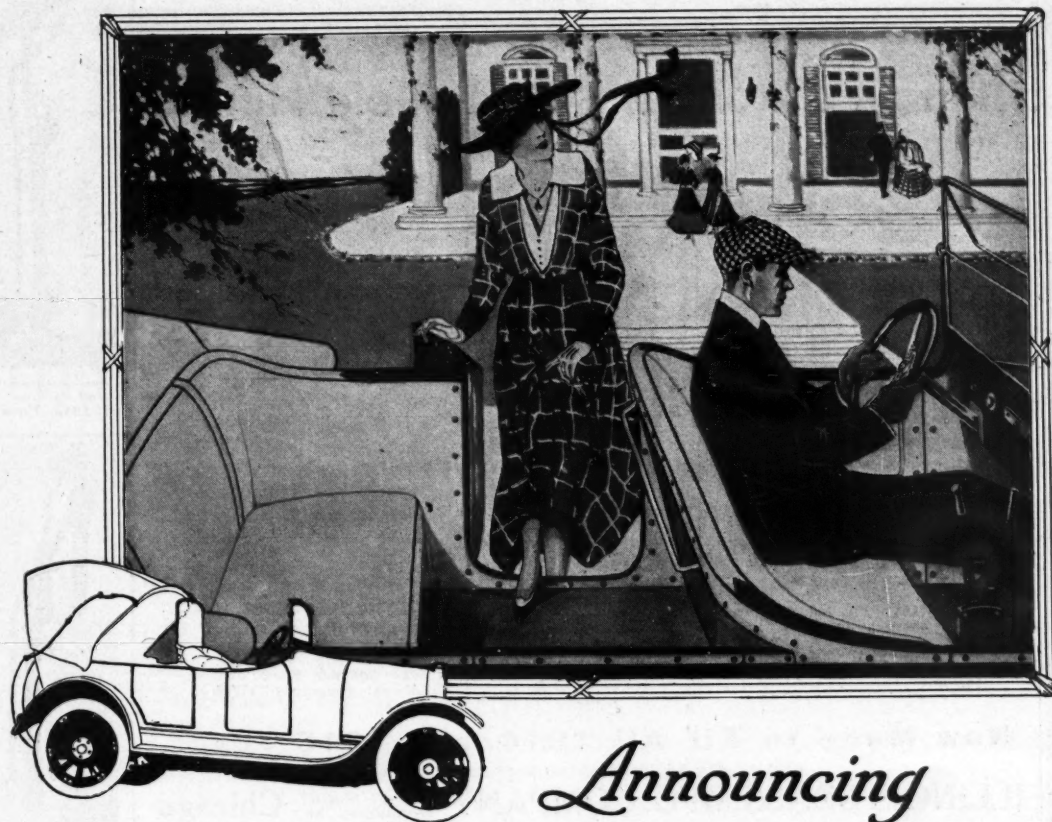
COVERT Transmissions are made in a full line of types and sizes, and our engineers will gladly show how easily our product is adapted to your particular need.

Covert Motor Vehicle Co.

Sales Office:
Detroit, Mich.



Factory:
Lockport, N. Y.



Announcing Campbell Detachable Upholstery

(The First of a Series of Full Page Advertisements in
The Saturday Evening Post, Literary Digest, etc.)

WHAT a Paris frock does for a woman, Campbell Detachable Upholstery does for a motor car—classes it.

Over the shabby upholstery of last year's car, or the shining newness of this year's, it works a genuine transformation. At a stroke, it gives the interior trim a luxurious look, a soft warmth and tone, found only in the finest limousines.

There is a set specially designed for practically every model of every car. It fits over the regular upholstery like the upholstery itself, becoming in appearance an inherent part of the car body. Any one can install it—no alterations are necessary. With a snap of its fasteners you adjust each hand-tailored part over seats, backs, arms and doors. With equal ease you slip it off for cleaning.

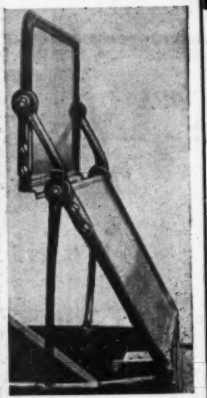
There is the same satisfaction in owning a car equipped with Campbell Detachable Upholstery that there is in being faultlessly dressed. There is an added comfort, and a very practical satisfaction, in the always cool, always clean seats. If you are buying a new car, ask to see it equipped in this latest style. If you want to make an old car look like new again, order its particular set of Campbell Detachable Upholstery from your dealer—today.

Dealers: Write for folder of fabric samples and discounts

Campbell Detachable Upholstery is made in a variety of smart motor fabrics and linens, to harmonize with cars of every color. Send for folder showing actual samples, and price list, with special discounts to the trade. Address The Perkins-Campbell Co., 624 Broadway, Cincinnati, Ohio. New York Office, 89 Chambers St.



The name Campbell
on the fasteners is
the quality mark of
genuine Campbell
Detachable Uphol-
stery.



For 1914 Ford Cars



Down to \$3

Illinois Automatic Windshield Hinge

No Need to Pay More

Tremendous demand and increased output of Illinois Automatic Windshield Hinges, making it unnecessary for you to pay \$10 or \$15 for a new windshield when for \$3 you can transform the old one on your Ford into a perfect ventilating, rain-vision shield, in just 5 minutes.

The Illinois Automatic Windshield Hinge insures a cool stream of air circulating through the car on hot days, and a sure, safe, rain-vision protector always. Formerly \$5, now only.....

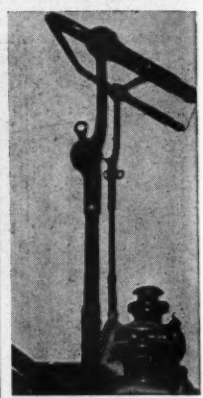
\$3

For 1915
Fords
with
Cowl
DashSpecial
Hinge for
1914
Fords

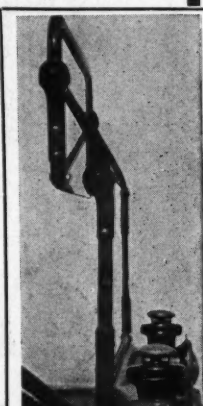
Makes Ford Windshields Clear- Vision, Ventilating

The only windshield hinge made of tempered steel, and guaranteed for the life of the car. Fits any 1915 Ford with cowl dash. Special hinge for 1914 Fords. Easy to attach. Simple adjustment for perfect ventilation and rain vision. Richly finished in black enamel. Price \$3 per pair. Write for free illustrated circular.

Dealers—Big demand by over 500,000 Ford owners. Liberal discounts. Write.



For 1915 Ford Cars



Now Made to Fit All 1914 and 1915 Fords
READY TO ATTACH IN OLD SCREW HOLES
ILLINOIS BRASS MFG. COMPANY 11-17 South Desplaines St., Chicago



Getting covered with

dirt and grease doesn't exactly please us. Yet there are always plenty of occasions arising for the car owner when he must do a regular man's job. A

Shanhouse MOTOR SUIT

in your tool box will come handy for many occasions. It is a one-piece garment made of a high grade olive khaki, easy to slip on and off, covers you from head to foot and protects your clothes. The original Motorsuit bears the Shanhouse label and our guarantee. Take no other.

If your dealer doesn't carry it, send \$2.00 for one prepaid. Give chest measurement and leg length. Money back if not entirely satisfactory

The Shanhouse Co., Rockford, Ill.

DYKE'S AUTOMOBILE AND GASOLINE ENGINE ENCYCLOPEDIA

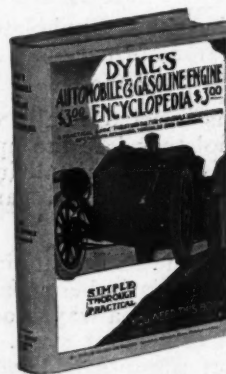
By A. L. DYKE, E. E., originator of the first automobile supply business, publisher of the first practical automobile book, manufacturer of the first float feed carburetor in America.

A Teacher, Guide and Reference on everything pertaining to motoring. Simple as the A B C.

It's worth ten times its cost if only placed on the shelf and used as a reference when you are stuck.

Over 1000 illustrations, 596 pages, 268 full page charts, 41 instructions.

EVERY SUBJECT SIMPLIFIED.



Illustrations Are Simplified

There are over 1000 illustrations, just the kind you will understand and a new idea of building the parts up with progressive "ben dayed" drawings, something new. You certainly will make a very fine investment by sending for this book at once—the quicker the better for you.

Price \$3.00

This book is endorsed by the leading motor authorities of the world and used by forty automobile schools.

This book is just as the name implies; an Encyclopedia. No matter what you want to know relative to a gasoline engine, you will find it in this book.

Any trouble you can think of—can instantly be located by turning to the index, then to the Digest of Troubles, which will give the cause and the remedy.

If you want to learn gasoline engines from A to Z—simply read the instruction Number Ten. Here you will find the first principles explained, then step by step you advance to the more complicated parts. After finishing this section you will understand all engines; auto, marine, motorcycle, aero and stationary engines.

You will understand the purpose of the valves, and the different valve principles. You will be able to time valves and do other repairs on engines.

CLASS JOURNAL CO., 910 S. Michigan Av., Chicago

*The Spring with
NO CENTER BOLT*



*The Spring with
NO CENTER BOLT*

More Tuthill Titanic Springs are used to replace broken springs than all other makes combined.

When a spring in your car breaks—perhaps miles from a garage or repair shop—you make up your mind then and there that you will not replace it with the same make of spring.

Dealers—write to your nearest Tuthill distributor

Albany	-	Albany Hardware & Iron Co.
Atlanta	-	- Elyea-Austell Co.
Baltimore	-	Baltimore Hub Wheel & Mfg. Co.
Boston	-	- Post & Lester Co.
Buffalo	-	- H. D. Taylor Co.
Chicago	-	- All Jobbers
Cincinnati	-	- The Ohio Rubber Co.
Columbus	-	- Griswold-Sohl Co.
Dallas	-	- The Fisk Co. of Texas
Davenport	-	- Sieg Iron Company
Dayton	-	- S. T. & G. A. Gebhart
Denver	-	- Auto Equipment Co.
Duluth	-	- Kelley-How-Thomson Co.
El Paso	-	- Western Motor Supply Co.
Indianapolis	-	- W. J. Holiday Co.
Kansas City	-	- Faeth Iron Store Co.
Lincoln	-	- Nebraska-Buick Auto Co.
Los Angeles	-	- Chanslor & Lyon Co.
Milwaukee	-	- Babcock Auto Spring Co.
Minneapolis	-	- Western Motor Supply Co.
New York	-	- W. E. Pruden Hardware Co.
Oakland	-	- Chanslor & Lyon Co.
Peoria	-	- The National Electric & Auto Supply Co.
Philadelphia	-	- Manufacturers Supplies Co.
Pittsburg	-	- Pittsburg Auto Spring Co.
Portland	-	- Chanslor & Lyon Co.
Rochester	-	- Sidney B. Roby Co.
St. Louis	-	- Auto Devices Co.
San Antonio	-	- The Fisk Co. of Texas
San Francisco	-	- Chanslor & Lyon Co.
Seattle	-	- Chanslor & Lyon Co.
Sioux Falls	-	- The H. F. Brownell Co.
Spokane	-	- Chanslor & Lyon Co.
Tampa	-	- The American Supply Co.
Toledo	-	- Union Supply Co.

Foreign Distributors

Automobile Sundries Co., 18 Broadway, N. Y.

If your car does not happen to come equipped with Tuthill Titanic Unbreakable Springs—in case of spring breakage, insist on a Tuthill Titanic. It costs no more than the ordinary kind and will last as long as your car—guaranteed forever against center breakage.

Your dealer or most any garage man has Tuthill Titanics in stock—ready for instant use—there's a Tuthill Titanic for every make of car.

Tuthill Titanic Springs are Dann equipped if desired.

If you are having trouble of any kind with your spring suspension, write us—valuable and expert advice free upon request.

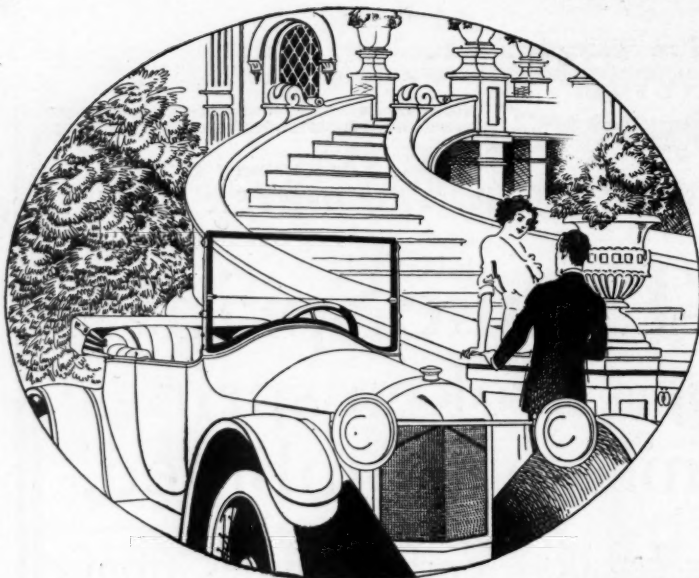
TUTHILL SPRING COMPANY

772 Polk St., Chicago, U. S. A.



*Tuthill Titanics are guaranteed
forever against center breakage.*

*Tuthill "Titanics" can be adapted easily
to any axle construction and quickly
mounted without any extra expense.*



Sentiment

is a basis of decision, but real worth is the final test of judgment.

Scripps-Booth luxurious light cars have induced by beautiful art design real sentiment on the part of purchasers, but a worth deeper than mere beauty has induced in Scripps-Booth owners a remarkable after-purchase appreciation which might even be called a pride-affection.

Scripps-Booth

No higher proof of Scripps-Booth standards could exist than the after-purchase enthusiasm of Scripps-Booth owners—owners who come from a class better able to judge motor cars and their performance than purchasers of any other light cars.

Combining the highest standards of motor car construction and design and the apex of com-

fort and luxurious travel with a real elegance of outline, Scripps-Booth cars are become a part of the home equipment along the most exclusive of the world's thoroughfares and in the most exacting of all metropolises.

A demonstration will eliminate the necessity of salesmanship and will convince you without argument of Scripps-Booth standards.



Scripps-Booth Company
Detroit, Mich.

MAKE \$250⁰⁰ A MONTH REPAIRING AUTOMOBILE TIRES

Sounds like a lot of money—IT IS—A WHOLE LOT of MONEY to be earning CLEAR every month—yet it's what hundreds of men we have established in the Automobile Tire Repair Business are making. You let down the DRAW BRIDGE for SUCCESS to enter into your career by getting into business for yourself. The business for you is the one where investment is small—the returns quick and for cash—where the margin of profit is large—the demand for your PRODUCT or SERVICE constant and ever on the increase.

A Haywood Tire Repair Equipment

tainty of success in this business is as sure as anything in this world can be—Each year adds thousands of new Automobile Owners—they need YOU to keep their tires in service.

Here Is Your Opportunity!

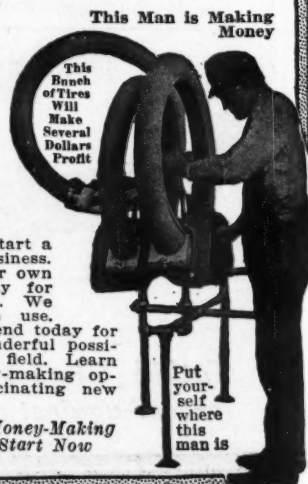
Be first to enter this new, big paying business in your town. Open your pockets. Let the dollars pour in. Act quick. Every auto sold means more tires to mend. Automobile business is growing fast—enormous field for tire repairing. Punctures and blowouts are common. Tires need retreading and vulcanizing. Something going wrong all the time. Thousands forced to buy new tires because they can't get old ones fixed. Think of the old bicycle days—repair shops on every corner—all making money—busy day and night. Autos make same proposition over again—only ten times bigger and better. Users of Haywood Tire Repair Plants are making big money. Johnston, Tex., writes: "I have made as high as \$18 in a day." Another man who bought a plant September, 1911, writes he has cleared over \$3000.00. That's going some! Operate a plant as a side line in connection with auto business—garage or as an independent business. Find neighborhood where there's a bunch of autos—get all the steady business besides transient work. Experience unnecessary. You learn quick. Simply follow directions—practice a few days on a couple of old tires and you'll be ready to coin money. Business comes fast and easy.

HAYWOOD TIRE & EQUIPMENT COMPANY 720 N. Capitol Ave. The New Money-Making
INDIANAPOLIS, IND. Business—Start Now

answers to all of these requirements of Old Dame Fortune—the cer-

Repair Tires At Home

Young men! and boys repair father's tires—get money he pays garage man. Get the neighbor's work. Make money to attend college or to start a garage and repair business. Auto owners—repair your own tires—save money—pay for your outfit in short time. We have outfits for home use. Anyhow, investigate. Send today for catalogue. See the wonderful possibilities in this marvelous field. Learn of the enormous money-making opportunities in this fascinating new business.



More Power for Your Car

The efficiency of your car is determined by comparing the **useful power delivered** to the driving wheels with that which is lost by friction. **Friction and loss of power is costly.** All of which emphasizes the vital necessity of using—



BECAUSE, NON-FLUID OIL reduces friction to a minimum by providing a durable, pressure-resisting cushion between all contact surfaces. It delivers the maximum of power to the driving wheels, thereby insuring you the greatest efficiency from your car with the least loss of power and with the least wear.

BECAUSE, NON-FLUID OIL is strictly neutral—hot or cold, wet or dry, its consistency never changes. It does not leak off like LIQUID oils, nor gum up, decompose, or develop acidity and score the bearings like ordinary greases.

BECAUSE, NON-FLUID OIL economizes upkeep. It lasts 3 to 4 times longer than LIQUID oils, or greases. Being of non-fluid consistency it **stays where put** and lubricates perfectly to the last small particle.

Get a can today and try it in comparison with what lubricant you now use so there can be no question of doubt as to NON-FLUID OIL'S superiority.

The original NON-FLUID OIL is identified by orange-colored cans bearing the above sprocket-wheel trade mark. Avoid substitutes.

New York & New Jersey Lubricant Co.

165 Broadway, New York

1430 Michigan Ave., Chicago



"K No. 00 Special"
grade for sliding
gear transmission

"K No. 000" for differ-
ential, compression
cups and all bearings

Reduced prices
for 1915

Ask your dealer

—AN OPPORTUNITY—

For

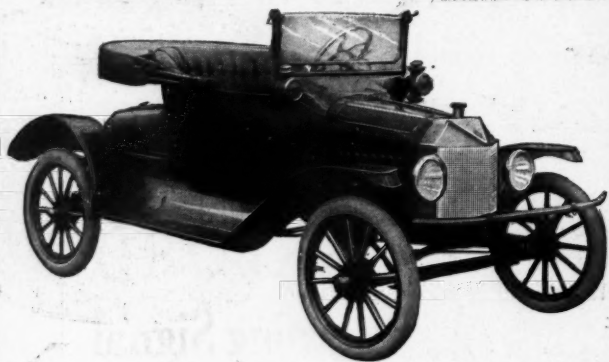
Distributors

of

Established

Reputation

A well known manufacturer of auto-
mobile accessories who has formerly
been selling direct to jobbers desires to
make connections with a number of
high grade, responsible distributors
who have conclusively demonstrated
their ability to make good. Immediate
action is necessary. Address Box E
396, c/o MOTOR AGE, Chicago, Ill.



1915 cowl dash Ford car equipped with a Livingston V type radiator and No. 2 streamline hood.

INCREASE EFFICIENCY—IMPROVE APPEARANCE
With

LIVINGSTON

Honeycomb Radiators and Sloping Hood

CUSTOMER—"My motor overheats."

DEALER—"You need a new radiator."

CUSTOMER—"What radiator do you recommend?"

DEALER—"Livingston, of course, because—

LIVINGSTON RADIATORS KEEP FORD MOTORS COOL

They are sold under a guarantee to give this kind of service. A Livingston Sloping Hood will give your Ford car that long streamline effect, so admired in cars of higher cost.

INSIST UPON THE NAME LIVINGSTON

Pointed Front Radiator.....	\$40.00
Straight Front Radiator.....	35.00
German Silver Finish, extra.....	5.00
Streamline hood for all models from 1912 to date.....	8.00

DEALERS WRITE FOR DISCOUNTS.

LIVINGSTON RADIATOR AND MFG. CO.

306 West 75th St., New York City

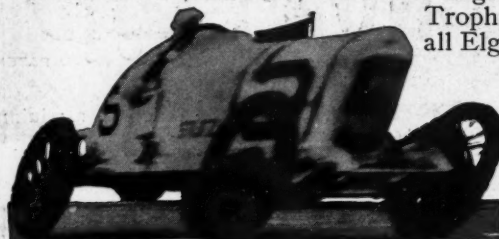
Wisconsin

CONSISTENT

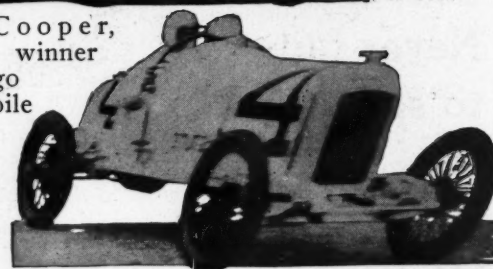
MOTORS

Upholders of American Motor Supremacy

Gil Anderson, STUTZ, winner of Elgin National Trophy, breaking all Elgin records. Second in Chicago Automobile Club Trophy Race.



Earl Cooper, STUTZ, winner of Chicago Automobile Club Trophy, breaking all previous Elgin records.



WISCONSIN MOTOR MFG. COMPANY

Sta. A—Dept. 311

Milwaukee, Wis.

1916 Glide

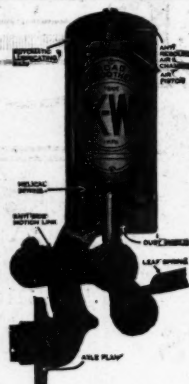
Light Six "40" \$1095 Compare These Features With Those of Other Cars

SO WE ask you, in the light of your knowledge of automobiles, to judge the Glide strictly on its merits. The specifications will help you—but better still, see the car—ride in it—drive it. Then compare it part by part with other sixes of the same class and size, and when you have done this, compare the price. In the new Glide Light Six "40" you will find the true yacht-like streamline body—unbroken lines from the headlights to the rear tonneau.

Roomy Tonneau. Flush Type Doors and Concealed Hinges. Superb Finish. Genuine High-Grade Enameled Leather Upholstery. Goodyear Demountable Rims. Goodyear 34x4 No-Rim-Cut Tires—Non-Skid on Rear Wheels. Rutenber High Duty Motor, Six Cylinder, 3x5. 12-Plate Dry Multiple Disc Clutch. Spicer Dust-Proof Self-Oiling Universal Joints. Tubular Propeller Shaft. Spiral Bevel Driving Gears. Pressed Steel Rear Axle Housing. Brown-Lipe Differential. Hotchkiss Drive. Crowned Fenders. Rim Type Tire Carrier. Unit Power Plant.

Two-Bulb Headlights—Conforming With City Ordinances for Dimming. Linoleum-Covered Runboards. Storage Battery Under Footboard. Brown-Lipe Transmission—Aluminum Case. Stewart-Warner Vacuum Gasoline Feed System. Westinghouse Ignition System. Westinghouse Starter, Bendix Drive. 18-inch Corrugated Walnut Steering Wheel. One-Man Top. Jiffy Curtains. Rain-Vision Windshield—Integral With Body. Wheel Base 119 Inches. Weight 2600 Pounds. Price \$1095 f.o.b. Peoria

The Bartholomew Co., 215 Glide St., Peoria, Ill.



Road Smoothers

Quickly applied to your Ford Car

give you Ford Car advantages with big, heavy car Comfort.

\$15 Set of
Four

One for each wheel

In buying here is what you must look for in order to combine Comfort, Safety, and Economy.

1. A spring to effectively take up the shock.
2. An anti-rebound air chamber to check the rebound.
3. Anti-side motion links to prevent side-rocking and swaying.
4. A construction that absolutely does not interfere with the steering.

You can find all of these vital factors only in K-W Road Smoothers, but after all's been said and done, it's results that count. The K-W guarantee covers not only workmanship and material, but results as well.

Sold by dealers who know the difference, everywhere. If your dealer can't supply you, sent prepaid upon receipt of price. Write for booklet "That Satisfied Feeling."

THE K-W IGNITION CO.
CLEVELAND, OHIO, U.S.A.

2835 CHESTER AVE.

Manufacturers of the 125,000 K-W Master Vibrators

Ready to Use

**45°
Safety
Plunger
Never fails
to sound
the
Garford
Warning**



\$3.85

**Use Your Elbow
to operate the new
GARFORD
Warning Signal**

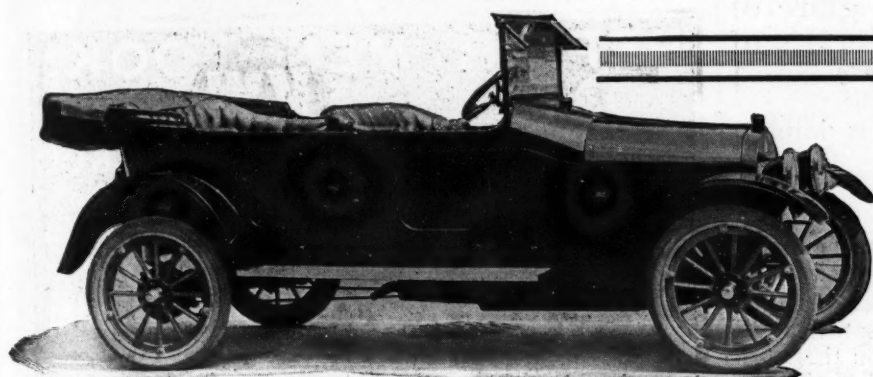
If you need two hands to drive your car, don't tie one up with a horn to operate. Have a new GARFORD set near your elbow, and by pressing with your arm, sound its warning note.

Most Convenient—Safest

The 45° plunger of the new GARFORD operates in line with the natural movement of your elbow as you push. Plunger does not require a blow. An easy push gets quick, sure, decisive response. The GARFORD never fails. Ask your dealer, and order today.

Dealers—GARFORD dealers stay Garford dealers. That is the best reason why you should join them, for profits. Easy selling line. Nationally advertised. Liberal discounts. Write today.

THE GARFORD MFG. CO., 2503 Olive St., Elyria, Ohio
Branch: The Garford Mfg. Co., Kansas City, Mo. Distributors: Dean Electric Co., Seattle, Wash.; Dean Electric Co., Los Angeles, Cal.; Sumter Telephone Supply Co., Sumter, S. C.



At its new price the SPHINX becomes a sensation—

The value that once seemed impossible at \$695—

The value that made the phenomenal demand for SPHINX Cars—

The value that once was the foundation of success for hundreds of dealers—

The value that once compelled a readjustment of light car prices—

Now at \$640 becomes all the more sensational.

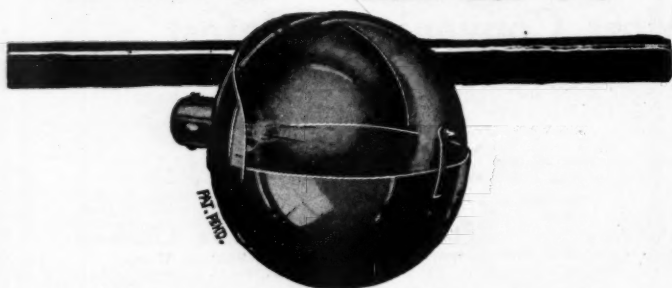
Just as this reduction in price widens the gap between the SPHINX and cars of its general class—so will the demand for the silent, powerful SPHINX grow—and with it the success of SPHINX dealers.

You can get immediate deliveries now and there still remains unassigned territory. Write or wire for proposition.

SPHINX MOTOR CAR COMPANY
YORK, PA., U. S. A.



The Law



The Law is waging war on blinding headlights. It says plainly that the glare of the headlight is a menace to the safety of others.

It isn't the power of your lights that is dangerous—it's the glare. A pair of

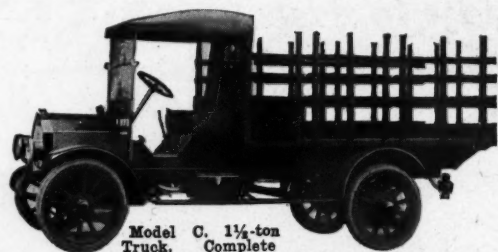
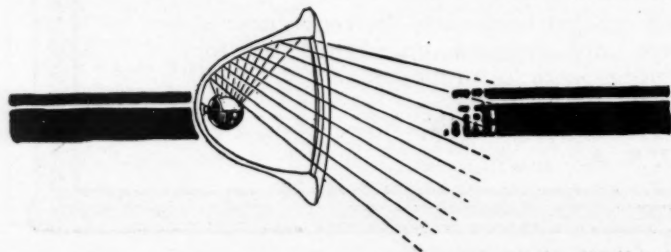
Wheeler Deflectors

—one on each of your headlight bulbs—satisfies the law by keeping the light from your lamps on the road-way—where it does you the most good—where it does nobody any harm—where the law wants it.

A pair of Wheeler Deflectors costs \$2.50 prepaid ready for attachment. They throw the full force of the light on the ground—100 feet or more ahead of you—the full force of the lights undiminished.

For sale by all good dealers or sent upon receipt of price, prepaid.

THE SPRINGFIELD AUTO DEFLECTOR CO., Inc.
516 Mitchell Building Springfield, Ohio



Model C. 1 1/2-ton Truck. Complete with Express or Stake Body, \$1950. Chassis only, \$1800

Model A-3	Model B-3	Model C
1500 lbs.	1 ton	1 1/2 ton
\$1125	\$1400	\$1800

"The MENOMINEE" TRUCKS

FOR ECONOMY

Besides economy in first cost and upkeep—There's economy in MENOMINEE stabling. One man operates the MENOMINEE, that does the work of 4 horses, and cares for it himself.

No need of a big force of stable men. Save their salaries.



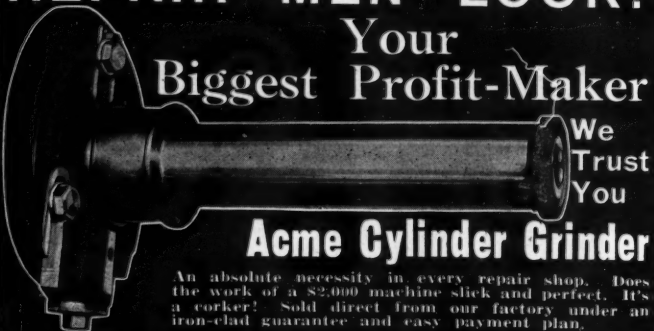
Dealers—Economy sells MENOMINEE. Get our catalog and dealers' proposition today.

D. F. POYER CO.
Menominee, Michigan



REPAIR MEN LOOK!

Your Biggest Profit-Maker



We Trust You

Acme Cylinder Grinder

An absolute necessity in every repair shop. Does the work of a \$2,000 machine slick and perfect. It's a corker! Sold direct from our factory under an iron-clad guarantee and easy payment plan.

GET OUR SELLING PLANS

Ship Back at Our Expense

If it fails to do all we claim for it, or is defective in workmanship or material, whereupon we refund every cent you paid.

We Take All the Chances

CYLINDER GRINDING is the most profitable, and when it becomes known that you are equipped for this class of work you're bound to get the business. We'll help you if you give us a chance and lend you a helping hand whenever possible. Those who've dealt with us will tell you we've got the right article at the right price, that we're fair and square; that our method of dealing is the best. Get your grinder right now. Get the big profits for yourself.

We Trust Everybody

anywhere, if honest. We haven't lost faith in mankind. Therefore we'll trust anybody who wants to do the right thing.

FREE BOOKLET Write for it. Contains full details. You want to make more money. Here's the way.

THE ACME GRINDER CO., Minneapolis, Minn.

FALLS TIRES



Fall Tires cost less per mile.
Write for the proof.

Guaranteed 5000 Miles

The Falls Rubber Company, Cuyahoga Falls, O.

BRANCHES AND DISTRIBUTORS

The Falls Rubber Co. 2001 Euclid Ave., Cleveland, Ohio
The Falls Tire Co. 2307 Indiana Ave., Chicago, Ill.
The Denver Rubber Co. 516 16th St., Denver, Colo.
The Myers-Hoffman Tire Co. . . . 1520 Jefferson Ave., E. Detroit
The Servus Vulcanizing Co.
Tunnel St. & Webster Ave., Pittsburgh, Pa.
Naegele & Lamb Co. . . 1204 Hennepin Ave., Minneapolis, Minn.
Falls Tire Co. of New Jersey 64 Halsey St., Newark, N. J.
Royal Tire Co. of New York 833 7th Ave., New York, N. Y.
The Falls Tire Co. 633 N. Broad St., Philadelphia, Pa.
Costello-Lang Co. . . . 556 Golden Gate Ave., San Francisco, Cal.
Seattle Tire & Rubber Co. 1624 Broadway, Seattle, Wash.
McAdams & McCreary Urbana, Ohio

NEVER SLIP



The Staude attaches to any make of automobile. The pure amber glass protects the eyes of the driver from all bright and glaring lights.

THE STAUDE GLARE STOPPER

The Staude Glare Stopper is one of the fastest selling motor accessories of the year. It solves the headlight problem from the right end.

Every driver needs all the light he can get on the road.

RETAIL PRICE

\$2.50

The Staude protects the driver's eyes from blinding headlights, yet in no way impairs the view of the road. It dissects the light rays and eliminates the glare.

The beautiful, rich, amber colored glass, 6 1/4 inches in diameter, looks fine and lends tone to any car.

The Staude is not "tinny" looking, and you know amber colored glass will not fade or curl like celluloid.

Most up-to-date dealers carry the Staude Glare Stopper, or we will send you one parcel post C. O. D.

The Staude is sold with a lasting absolute guarantee. If you are not delighted with the Staude and convinced after using it that it is indispensable to you, return it and your money will be refunded.

DEALERS

Our quantity discounts for jobbers and dealers allow you a good margin of profit. The Staude means quick turnovers.

Write us.

E. G. Staude Manufacturing Co.
2675 University Avenue St. Paul, Minn.

Dear Sirs:
Please send me by Parcel Post, C. O. D. \$2.50 prepaid, one complete
STAUDE GLARE STOPPER

with the understanding that I may return it, if unsatisfactory, and get my money back.

Make of car.....

Name

Address

City..... State.....

"WHITNEY" CHAINS

The Most Practical for Motor Trucks



THE WHITNEY MFG. CO.
HARTFORD, CONN.

Chains Keys Hand Milling Machine

For Leaky Cylinders

Superior to All Others



PATENTED AUGUST 8, 1912

A Piston Ring Which Gives Compression in "Out-of-Round" Cylinders as Perfectly as in True Ones



Here is a piston ring that gives 100% efficiency to every type of motor, engine, compressor or pump. Ideally adapted to use in Automobile and Motorboat engines. Gives compression when all others fail. No need to rebore worn cylinders—simply install EVER-TIGHT piston rings and the motor is good as new.

EVER-TIGHT piston rings are made up of three individual, interlocking rings, grooved together to give flexibility and reduce friction. This three-part construction is clearly seen in illustrations above. This is the only perfect three-piece piston ring on the market.

If dealers do not carry EVER-TIGHT piston rings, Auto repair men should write us. Jobbers and dealers wanted everywhere. Write for particulars.

THE EVER-TIGHT PISTON RING CO.
1432 CHESTNUT STREET ST. LOUIS, MO.

Guaranteed for 10,000 Miles



BRICTON Pneumatic Tires are guaranteed for 10,000 miles and under a specific 10,000 mile written service guarantee. What more can you ask of a tire? With Bricton Tires, punctures, blowouts and rim-cuts are eliminated—they are proof against ruts, oil and gasoline. Resilient and easy riding, too.

Try Them at Our Risk

Give Bricton Tires a free trial on your own car. Put them to test at our expense. Find out why Bricton Tires sales are increasing daily.

Your Tires Rebuilt the Bricton Way

If the fabric in the tires now on your car is in good condition, we can take them and make them proof against rim cutting, punctures, blowouts, sidewall breaks, skidding, ruts and oil and give you thousands of miles of additional service.

Write today for full information about Bricton Tires. Tire Rebuilding and details of our liberal Free Trial Offer.

THE BRICTON MFG. CO.
1295 Bricton Bldg.,

Brookings South Dakota

Bricton Pneumatic Tires

\$1.50



KNOWLSON Spring Leaf Spreader

Makes Spring Lubrication Easy

WARNING: We advise the trade that we intend to rigidly prosecute every person, not authorized by us, who makes, sells, or offers for sale, any spring leaf spreader or opener with wedges, as they infringe our patent rights. To avoid complications insist on KNOWLSON'S Spring Leaf Spreader.

Make Springs Last Longer

Don't let the leaves of your springs rust together, squeak, and break. Keep them alive all the time, with proper lubrication. Get 100% spring efficiency, and an easy-riding car, with KNOWLSON'S Spring Leaf Spreader and a little grease.

Fits any automobile spring. Simple, quick, effective. Won't damage or mar springs. Makes shock absorbers unnecessary.

Write for free illustrated circulars. Sent anywhere, prepaid, for..... \$1.50

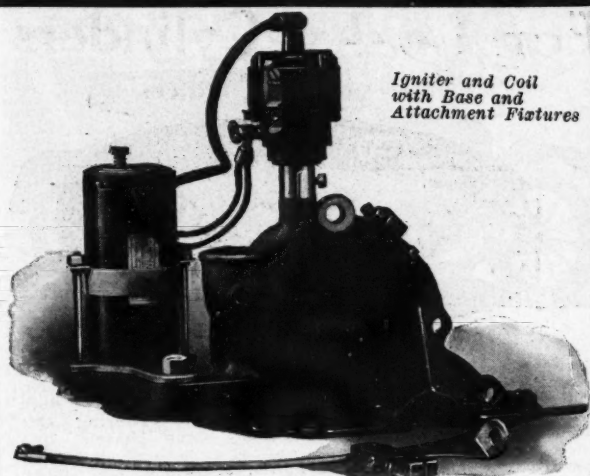
Dealers Wanted

Spring Leaf Lubricator Co.

1004 Forest Ave.
Ann Arbor Michigan



Note the Opening



Igniter and Coil
with Base and
Attachment Figures

Modernize Your Ford AUTOMATIC IGNITION CONNECTICUT

Full efficiency from your Ford motor; no timer, magneto dash coil or vibrators; smoother running engine; more power on the hills—are a few of the results obtained by equipping your Ford with Connecticut, the 1915 ignition system.

A. J. PICARD & CO.

Sole Distributors

1720-22 Broadway

New York

CORRESPONDENCE SOLICITED WITH FORD OWNERS
AND DEALERS

A New Era in Gas Lighting—

"Brilliant" Burners THE PERFECT HEADLIGHT



Read this statement and remember we back it up with our guarantee. They give you **THREE TIMES** the light of the ordinary burner, without increasing the cost of operation; or the same light for **ONE THIRD** the cost of operation. Can be used in **ANY** form of headlight adapted to the use of acetylene gas tank. Can be turned down. Can instantly be adjusted to comply with city ordinances. Can be used without front glass in lamps. Can not crack the reflector. They do not flicker.

**"Brilliant" Burners
sell for \$3.00 per set
and are fully guaranteed**

If your dealer can not supply you,
we will upon receipt of price.

DEALERS! "Brilliant" Burners on your counter
sell themselves. Put a few sets in your window
and let them work for you. Get our proposition.

MONOSMITH BROTHERS
SPENCER, OHIO, U. S. A.

SPLITDORF COMMON SENSE SPARK PLUGS

The very simplicity in constructive details of **SPLITDORF PLUGS** strongly appeals to the leading motorists. A core easily accessible for cleaning and yet absolutely gas-tight is a distinct feature.

Overland, Franklin, Jeffery, Pullman and Knox are prominent cars equipped with **SPLITDORF**.

**SPLITDORF
ELECTRICAL CO.**

NEWARK, N. J.



Today Is a Day of Specialties

Our Specialty is Making Rubberized Trimmings for Automobile Tops, Curtains and Upholstery

**The Best Quality That Can Be
Produced for This Purpose Is**

BULL DOG QUALITY

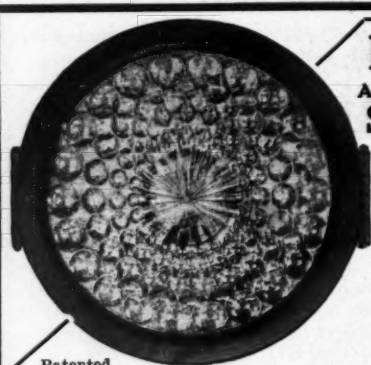
Any old trimming is good enough for any old car, but **BULL DOG QUALITY** is a luxurious attraction to the best cars built—when you really want quality that looks better and possess almost unlimited wear, there is just one thing to do and that is

Use Bull Dog Quality

We are the sole manufacturers of Numotor Fabrics

SHALL WE SEND YOU
SAMPLES AND PRICES?

L. J. MUTTY CO., BOSTON, MASS.



Patented

and distributes the light where needed, making ditches, ruts, etc., plainly distinguishable, and is never dazzling at any distance.

Double-Lens

Auto Headlight Glass
STOPS THE GLARE
and Dazzle
DOES NOT DIM
Your Lights

Double-Lens is a Light Diffuser, and not a Dimmer. Approved and used wherever Dimmer Laws are in effect, does not cut down the light, but gives a driving light several hundred feet ahead,

Prevents Accidents and Arrests

Double-Lens is the universal headlight glass for city and country driving, making night driving as safe as daylight. Prevents accidents to driver and pedestrians. Complies with the law, avoiding arrests and fines.

Fully Guaranteed

Satisfaction Guaranteed or Money Refunded

Double-Lens are beautiful in design and appearance; an improvement to any Motor Car, and fit all size lamps. Price \$1 to \$5 per pair, according to size. When ordering, state diameter of lens.

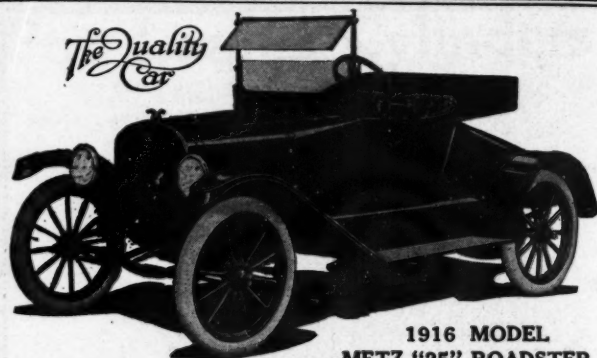
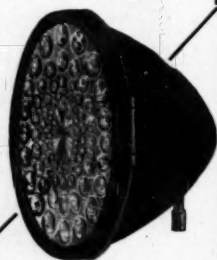
Write for Folder. Telling How to Secure DOUBLE-LENS on

Ten Days' Free Trial

Interesting dealers' proposition

Double-Lens Glass Co.

1146 So. Michigan Ave., CHICAGO



1916 MODEL

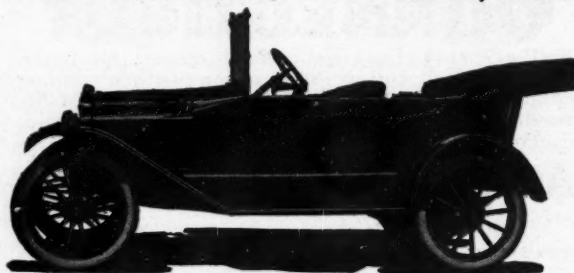
METZ "25" ROADSTER

METZ

1916 models. Price, \$600 each, completely equipped. Both Roadster and Touring Car built on same chassis, 108-inch wheel base, and carry identical equipment, including electric starter and electric lights, 25 h. p. water-cooled motor, large wheels and tires, rain vision wind shield, instant one-man top, speedometer, built-in gasoline gauge, signal horn, etc. Write for DEALER particulars and new illustrated catalog "K."

METZ COMPANY,

Waltham, Mass.



1916 MODEL, METZ "25" TOURING CAR

SIMMS ^{High Tension} MAGNETO and SIMMS-HUFF Electric Starting and Lighting System

Automobile Engineers unite in pronouncing Simms Products "Electrical Equipment Par Excellence."

The SIMMS MAGNETO Co.

East Orange, N. J.

Schrader

FREE

AIR IS FREE—
Rubber Costs Money—
RIDE ON AIR

When the air in your tires falls below a certain pressure you no longer are riding on air, but on rubber.

Measure your air with a

Schrader

UNIVERSAL TIRE PRESSURE GAUGE

and save your tires.

Price, \$1.00

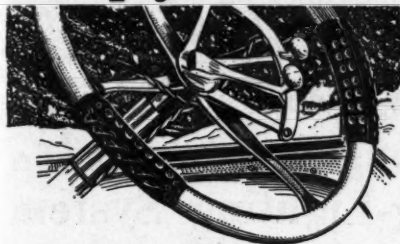
at your dealer's, or

A. SCHRADER'S SON, Inc.

783-793 Atlantic Ave. Brooklyn, N. Y.



Keep your hands warm



Steer Warms

Keep the hands warm in coldest weather. Warm hands warm the body and ward off colds. You can also grip the wheel better. Steer Warms make for health and safety. Steer Warms are heated by electricity from battery or magneto and consume very little current. Easy to put on—no screws—no holes to bore. Lace on—wire up—that's all. Never get out of order. Look well on car. Sold under 5 yr. guarantee. If your dealer hasn't them, will send prepaid ready to attach upon receipt of price. Money refunded if not as claimed.

Prices: For Ford Car.....\$5.00 In Canada.....\$6.50
For Other Makes... 7.50 In Canada..... 9.00
Give make of car and voltage of batteries
—if Ford whether 1914 or 1915 model

Ieco Manifold Plug Starts Car in Zero Weather

This electric plug primes your car from seat and puts a hot mixture in cylinder so car starts at once. Helps your self-starter and keeps battery fully charged. Starts any car as easy in Winter as in Summer.

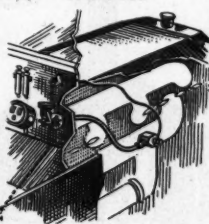
Also Saves Money for You
When used as an auxiliary air valve saves you 25% on fuel. The Ieco Plug detects carburetor trouble, clears cylinders of carbon. Easy to install. Nothing to get out of order. 2 yrs. guarantee. If your dealer hasn't it, will send prepaid upon receipt of \$5.00; Canada \$6.50—complete. Money refunded if not as claimed.

Starts Your Car Easily
When ordering specify voltage of storage battery. Ford cars require 6 dry cells.

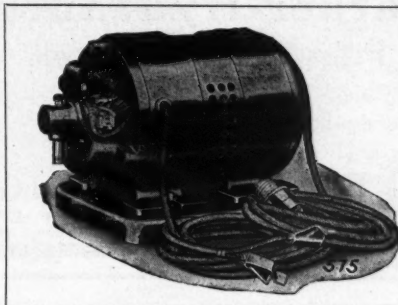
Dealers who want to handle fast selling accessories during the dull season should write us at once.

Interstate Electric Co., 848 Perdido St., New Orleans, La.
Descriptive Circular on request

while driving in Winter Time. Be Comfortable. Put on a pair of light mittens, jump into your car and drive for hours in the coldest weather—then go into the house and write a letter or play the piano.



Robbins & Myers Battery Charging Sets



These motor-generator battery charging sets are made in sizes suitable for public or private garages. The larger sets will charge several batteries at a time.

They connect to any lamp socket and require no attention. All that is necessary is to screw the motor lead in a lamp socket and attach the generator terminals to the battery. When the battery is fully charged, the outfit will float on the line without injury to the battery.

Garages can make excellent profits by installing one of these sets for charging batteries for customers.

Jobbers and Dealers will find these outfits easy, profitable sellers. Write for prices and discounts.

Prices, \$42.00 and Up

THE ROBBINS & MYERS CO.

SPRINGFIELD, O.

New York Boston Philadelphia Rochester Cleveland
Cincinnati Chicago St. Louis San Francisco

FOSTER OWL LIGHT

Does the looking after dark. Throws a powerful spotlight in any direction. Makes strange roads safe. Locates dangerous turns. Shows how close you are to the edge of the road. Prevents collision with unlighted horse-drawn vehicles. Looks around corners and follows winding curves.

"Sees Everywhere at Night"

Enables you to read road signs and street names. Spots forks, turns and landmarks long before you get to them—enabling you to follow Blue Book routes without slowing up. Cuts through night fog like a knife. Shines like a locomotive headlight up the road. Operates from storage battery or dry cells. Attaches to windshield or body of car. Handsomely finished in black with nickel trimmings. The only searchlight obtainable with FOSTER Patented Universal Swivel.

Write For Free Booklet



\$9

Complete

Dealers Wanted Everywhere

C. H. Foster

Manufacturers and Distributor of Motor Car Accessories
2303 Michigan Boulevard
CHICAGO

Manufacturers

The highest efficiency—the service that sells your output before the close of the season—depends

largely on the construction of the smaller points.

Efficient brushes

make efficient

motors and

motor

cars.

Speer Metallic Brushes
Dealers
You sell cars to stay sold. Inferior brushes bring them back to eat up your profits, in adjustments.

SPEER Metallic Brushes give perfect service. They don't come back. Write for discounts.

Speer Carbon Co.
Saint Marys, Pennsylvania





It Rings True!

Our proposition to dealers rings true just as

Parker-Hydraulic Pressed Steel Wheels

ring true to users. Write for attractive dealer's proposition now.

\$19.75 SET OF FOUR And Extra Rim



The Hydraulic Pressed Steel Co.
3170 East 61st St. Cleveland, U. S. A.

Gould
STORAGE BATTERY

The Strong Right Arm of a Starting-Lighting System

GOULD STORAGE BATTERY CO.
General Offices, 30 E. 42nd St., New York

Write for our Agency Proposition



CONSTANT DEPENDABLE SERVICE

PITTSBURGH MODEL ENGINE COMPANY

MODEL MOTORS

PITTSBURGH PA.

EISEMANN

The most simple—the most accessible—the most durable—the most efficient magneto ever produced is the new Type G-4.

The Eisemann Magneto Company
Sales and General Offices,
32-33d St., Brooklyn, N. Y.
New York, N. Y. Indianapolis, Ind. Detroit, Mich.  245 W. 55th St. 415-417 N. Capitol Ave. 802 Woodward Ave.



ANNOUNCEMENT

The following prices f. o. b. Detroit, effective August 2, 1915

Ford Runabout.....	\$390.00
Ford Touring Car.....	440.00
Ford Town Car.....	640.00

No Speedometer included in this year's equipment, otherwise cars fully equipped

Ford Motor Company
Detroit, Michigan

***Hartford**
SHOCK ABSORBER
For Comfort, Safety, Economy.



Stops jolting, jarring and vibration. Eliminates side-sway. Contributes to solid auto comfort. Prevents spring breakage. Makes tires last longer. Cuts cost of maintenance. Insures longer life for your car.

Complete literature on request. Write mentioning make, model and year of car and we will advise how to equip to secure genuine comfort. Your new car will be Hartford-equipped if you insist.

HARTFORD SUSPENSION CO., 146 Morgan St., Jersey City, N. J.
E. V. HARTFORD, President
*Formerly Truffault-Hartford Shock Absorber.

SHALER
VULCANIZERS

Electric—Steam—Gasoline—Alcohol

There is a Shaler Vulcanizer for every purpose from The Tourists' Models to carry in the tool box to large equipment for Garages—Tube-Kit \$2, Ford Kit \$2.75, Vul-Kit \$3.50, Model D \$12.50 and Vulcanizing plant for Repair Shops \$60.

The Shaler is recognized as standard and is used in best Garages and Repair Shops everywhere. We are the world's largest Vulcanizer makers and Guarantee every Shaler Model.

Write for complete new catalog.

C. A. SHALER CO., 3 Fourth Ave.
Waukegan, Wis.

KINGSTON
CARBURETOR

Save Money by Economizing Gasoline

Four floating bronze ball valves opening automatically under different motor suction supply a uniform mixture at any speed, regardless of hot, cold, wet or dry weather.

Write for details and let us tell you why so many manufacturers are adopting this carburetor as standard equipment.

MADE BY THE OLDEST MANUFACTURERS OF CARBURETORS IN AMERICA.
ESTABLISHED 1895

BYRNE, KINGSTON & COMPANY, Kokomo, Indiana



After hearing what Mr.
GLENN H. CURTISS,
the gasoline motor expert, said of
OPCO I tried it out and have
put my discoveries into a little
booklet which is yours for the
asking—address "James."

American Oil Products Company
Buffalo, N. Y.

Dealers—get discounts and terms

Provided
with or without
padlock.



for
FORDS

Oakes Kranklock

Oakes Kranklock combination starting crank holder and lock and license holder. Make your car thief-proof with this handy and serviceable combination. It holds the starting crank rigid and license tag securely. Every Ford owner needs one. Can be put on easily in a few minutes. No holes to drill. Prevents garage employees from using or tampering with your car while in garage.

Without Padlock
50c
\$1.00 with Special Yale Padlock
Made by the makers of the famous Oakes
Fan-Horn-Pump \$12.50
Fan-Pump 7.50
Fan-Horn 5.00
Any Oakes accessory shipped direct on receipt of price.
Write for complete description of our entire line.
THE OAKES CO., INDIANAPOLIS, IND.

Firestone Cure-Cut



Keeps out
moisture.
Quickly applied
—and it holds

Firestone Accessories

—Are Strongest in Service
—Never Fail in Results
—Add to the Dealer's Reputation
—Have Firestone Quality in Them

WILL BOOST YOUR BUSINESS
Firestone Tire and Rubber Co.
"America's Largest Exclusive Tire and Rim Makers"
Akron, Ohio—Branches and Dealers Everywhere



Standard
\$3.00
Special for Fords
\$2.50

Instantly your horn crashes out its warning. No reaching for a button. Use your hands and strength to control your car. The Seng Switch is within the finger's distance from any point on your steering wheel. Completes your warning signal. Used on fire engines, ambulances and other vehicles where instantaneous, unfailing warning is essential to life and limb. Attaches in 15 minutes. Fits all cars—all makes of horn. At your dealer's for postpaid on receipt of price. Get circular—full description, 4 styles and prices.

Dealers Wanted Everywhere

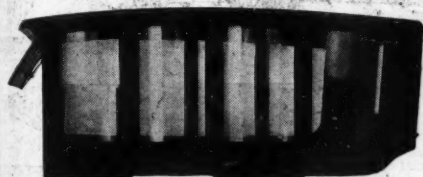
W. P. Seng, Mfr., 1446 Dayton St., Chicago

At Your Finger Tips

Danger? Quicker than thought
your finger touches the

Seng Switch

Limousine Tops for Ford Cars



FITS
1913-14-15
TOURING
CAR
PERFECTLY

Winter driving isn't very comfortable in an open car, and unless a man has a limousine, he usually stores his machine during the coldest months. Why lose from 3 to 5 months' pleasure when you can buy a limousine top so reasonable? This limousine is durably constructed; the framework is made of the best kiln-dried lumber, reinforced at the corners. It is fitted with an adjustable rain vision windshield and handsome cowl dash which add to the style and appearance of the car. Won't last long at the price, so send your order at once.

Special Price, \$110.00

AUTO PARTS CO., 737 W. Jackson Blvd., Chicago

Gasoline Can't Explode

You can build a fire under a McNutt can—you can hold a match in the opening of a McNutt can—it will never explode.

Hundreds of tests have been made by the New York and other Fire Departments, but no McNutt can has ever exploded.

Also—these cans prevent loss by evaporation and are so well made and reinforced that they will outlast 20 ordinary containers.

SEND FOR CATALOGUE—Our catalogue describes cans for every use and gives prices. Tear out the advertisement now to remind you to send for it.

DEALERS—These cans and devices sell on sight; remarkable opportunity; write for proposition.



JOHN C. EAMES, Inc.

320 Broadway

New York

KISSELKAR

The new designs of the ALL-YEAR Car include a Detachable Coupe Top at \$300 as well as a Detachable Sedan Top at \$380.

Write us about the new touring models, the 32-Four at \$1050, the 36-Four at \$1250 and the 42-Six at \$1495—three great values.

Literature ready.

KISSEL MOTOR CAR COMPANY
121 Kissel Avenue Hartford, Wis.

The ALL-YEAR Car

REPUBLIC TIRES

PLAIN, "WM"
AND STAGGARD TREADS

TRADE MARK REGISTERED
U. S. PATENT OFFICE

MIDGLEY PATENTED TIRES

Wire Tread

Plain and Non-Skid

Inner Tubes

*Unexcelled—Write for
Complete Information*

The Midgley Tire & Rubber Co.

Dept. 11, Lancaster, Ohio

701

SPARTON

Safety Signals

Have the far-reaching call for country roads—the quick, snappy shriek for city traffic. Use the Sparton on your car.

The Sparks-Withington Co.
Jackson, Michigan



Model
"F" \$4

finished in
satin black
and nickel or
all black.

Highway Six
\$1690



National Motor Vehicle Co., Manufacturers, Indianapolis

Highway
\$1990

12

DOUBLE SEAL TIRE VALVE

No tool needed to
seat or remove Valve

Interchangeable with All Stems

Fifty Cents Per Dozen
Single Valves, Five Cents

Double Seal Tire Valve Company
1790 Broadway New York City



Actual
Size

Lexington

CRITERION OF ITS CLASS

Thoroughbred Six—\$1875

Minute Man Four—\$1375

Six Supreme—\$2575

Equipped with Moore Multiple Exhaust System

Write for details and co-operative dealer proposition

The Lexington-Howard Co.

18th Street West

Connersville, Ind., U. S. A.

HEINZE

HECO

FACTORIES
Lowell,
Mass.

BRANCH OFFICES
Minneapolis
Chicago
New York

High Tension Magneto

Better Material
Better Work-
manship

Better Manu-
facturing
facilities

Make Heinze the Better Magneto

HECO

SALES OFFICES
Detroit,
Mich.

NEW ENGLAND
DISTRIBUTOR
A. P. Homer
Boston

HEINZE ELECTRIC COMPANY

JUMBO SPARK PLUGS

Jumbo
Jant
\$1.25

Jumbo
Regular
\$1.00

Jumbo
Junior
\$0.75

Jumbo
Special for Fords
\$0.75

Gibson-Hollister Mfg. Co.
3380 WASHINGTON ST. 69-7 BOSTON, MASS.

HOLLIER

1915 EIGHT 1915
It leads the leaders
THE LEWIS SPRING



LONGUEMARE
CARBURETOR

The Carburetor of the New School completely automatic without the use of springs, balls, cams or auxiliary valves

LONGUEMARE CARBURETOR CO.
1876 BROADWAY NEW YORK

The Niagara Motor Car \$740

36 H.P., 5 Pass. Wgt. 1970 lbs.

The Niagara Motor Car meets an exacting ideal. Full-sized and generous in all proportions. Beautiful to the eye. Stylish, dignified, snappy, attractive and superbly finished.

Exceptional opportunity for dealers. Unusual dealer assistance. Write or wire for "Dealer Helps" talk, and full information about our liberal selling plan.

MUTUAL MOTOR CAR COMPANY

Makers of Niagara Motor Cars

917-927 Main Street

Buffalo, N. Y.



CAMPSON
FEATHEREDGE
INNERTUBE PLUG

Repairs forever any puncture or small blowout in 1½ minutes. No vulcanizing—no cement—no patches. Sampson Plugs are guaranteed never to leak or injure tube or shoe. Money back if you want it, at any time. Sampson Plugs come in three outfits: No. 1—Tool and 6 Plugs in carton, \$1.50. No. 2—Tool and 12 assorted plugs in black enamel box, \$2.50. No. 3—Motorcycle kit; tool and 6 small plugs in stout wallet, \$1.50.


Stevens & Co., 376 Broadway, N. Y.

DELCO

ELECTRIC LIGHTING CRANKING IGNITION

The man who sells a Delco equipped car has a talking point with a wonderful appeal to it.

THE DAYTON ENGINEERING LABORATORIES COMPANY
Dayton, Ohio



1916

\$850



Same Car
New Price

Touring &
Roadster

Tomahawk Spring Lubricator

Will Increase the Comfort of Riding in Your Car 100% and Stops the Squeak



The simplest, quickest and most effective tool on the market for spring lubrication. Made of the finest drop-forged steel, hardened and nickel plated. Graphite grease is fed from the container in handle. One blow of the hammer, a twist of the wrist, and the trick is done.

Price 75c

Charles W. Manzel Co. 311 Beard Avenue **Buffalo, N. Y.**

Corcoran Lamps

GAS, OIL, AND ELECTRIC
CORCORAN LAMP CO.
CINCINNATI, OHIO

HOUK

"QUICK CHANGE"
WIRE WHEELS



The United States Motor Truck Co.
CINCINNATI, OHIO
OFFERS A FINE OPPORTUNITY TO DEALERS

U. S. MOTOR TRUCKS

Get Our Proposition

FLEXIBLE and DURABLE
Economical and Powerful

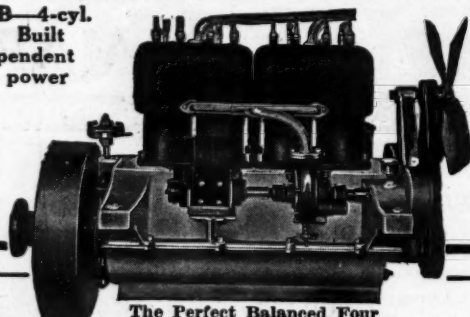


MADE IN 2, 2½, 3 AND 4 TON CAPACITY

The correctness of its construction combined with best quality materials and right prices, make the U. S. Truck a splendid value for buyers and a money-making proposition for dealers.

Specifications and prices on request. Address Contract Dept. B.

Model B—4-cyl.
4½x5. Built as independent or unit power plant.



The Perfect Balanced Four
Been making good for 15 years on pleasure and commercial cars. Special model for Elmore and White Steam cars. Write
BRENNAN MOTOR MFG. CO. Syracuse, N. Y.

BRENNAN MOTORS

4-Cyl. Models
Model M 4x5
Model B 4½x5
Model 11 5x5
Model 12 5½x6
Model 12 6x6
6 Cyl. Model 4½x5

22-72 Series

MERCER MOTOR CARS

Four Cylinder Only

Ready for Delivery Early in November
DETAILS ON REQUEST
MERCER AUTOMOBILE COMPANY
800 Whitehead Road, Trenton, N. J.

Steel Protectors



Each section 2" wide ⅛" thick. They hook to rim. As flexible as ever. Anti-skid, can't blow out or rim cut.

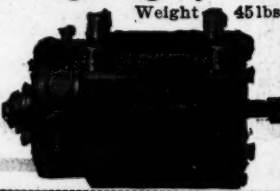
HOW CAN THE RUBBER WEAR OFF IF IT IS COVERED WITH STEEL?
Try 2 or 3 sections over any old blowout
Special prices to the first in new territory
Kimball Tire Case Co., 173 Council Bluffs, Ia. Tire covered complete

Dyneto TRADE MARK

SINGLE UNIT Electric Starting and Lighting System

Famous on the Franklin
Weights less than two-unit systems. Naturally more efficient and less complicated than either one of two units

A Combination Motor Generator
Write for Particulars
DYNETO ELECTRIC CO., Syracuse, N.Y.
Send Us Your Electrical Problems



TOO LATE

after your Electrical Equipment breaks down, to avoid the delays and expense of repairs. But your lights and starting motor would not have failed you if you had installed a

Weston

Model 354 AMMETER
On Your Dashboard or Cowl
It will keep you posted every minute regarding electrical conditions. It gives you warning of approaching trouble. Its exact information is invaluable—the cheapest and best insurance you can buy.
Write for full information.

Weston Electrical Instrument Co., 10 Weston Ave., Newark, N.J.
Branches in the Larger Cities



SALISBURY

AXLES WHEELS PROPELLERS

Salisbury Wheel & Mfg. Co.
JAMESTOWN, N.Y.

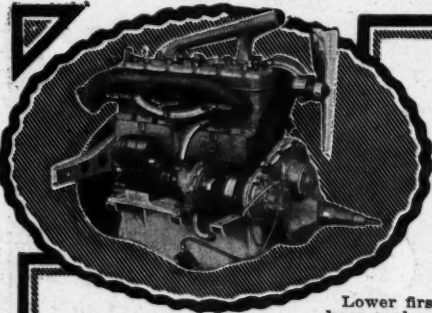
Used in America's Best Light Weight Cars
—because service is built into

THE RUTENBER MOTOR

Lower first cost and smaller upkeep make RUTENBER the economy motor for all cars.

Model 20
3½x5
4-cylinder

The Rutenber Motor Co.
Marion, Indiana
Chicago Office.....10 S. La Salle St.

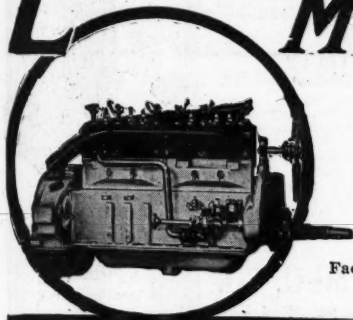


WINTON SIX

The Winton output is less than 3000 cars a year. Owners say the Winton Six is America's most worthy car. It is backed with a Service not duplicated by any other maker. And every Winton Six is finished to meet its buyer's individual taste. Write for catalog today.

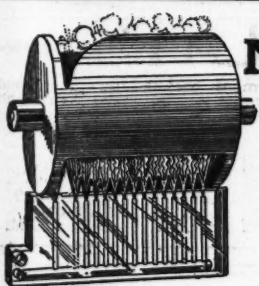
THE WINTON COMPANY
424 Berea Road, Cleveland, Ohio
World's First Maker of Sixes Exclusively

Continental Motors



Models—FOURS
Model U, 2 1/2 x 4 Model C, 4 1/4 x 5 1/4
Model N, 3 1/2 x 5 Model E, 4 1/2 x 5 1/4
Model N, 3 1/2 x 5 Model T, 5 x 5 1/4
Model C, 3 1/2 x 5 1/4 Model T, 5 1/4 x 5 1/4
Models—SIXES
Model 7 W 3 1/4 x 4 1/4
Model 7 N 3 1/2 x 5 1/4
Model 6 P 3 1/2 x 5 1/4

CONTINENTAL
MOTOR MFG. COMPANY
DETROIT, MICH.
Factory Representative, K. F. Peterson,
122 S. Michigan Ave., Chicago.



THE MASTER Carbureter

will give you the maximum efficiency from that engine—power, speed and fuel economy. Its simple construction eliminates adjustment, and makes your carbureter trouble a thing of the past.

Fuel Inlet Master Throttle and Fuel Distributor

A MASTER user is always a MASTER enthusiast.

MASTER CARBURETER CORPORATION

1804 West Fort Street, Detroit, Mich.

Pacific Coast States: Master Carbureter Co., Los Angeles, Cal.

Bridgeport Pumps

The Bridgeport Line includes pumps of varying styles and sizes adapted to the requirements of every type of car and tire.

Jobbers and dealers write for discounts.

Bridgeport Brass Company
Bridgeport, Conn.



ALWAYS ON THE JOB

Standard
DETROIT USA

Chain and
Chainless
Trucks

Meet Every Demand

DEALERS should carefully consider the rapidly growing demand for standardized heavy duty, double duty 4-cylinder trucks. The standardized "STANDARD" meets this demand in every way.

Send for booklet B 30, describing all capacities.

STANDARD MOTOR TRUCK CO., Detroit, Mich.

FREE ROAD MAPS

New England States
New York State
New Jersey

Pennsylvania
Southern States
Middle Western States
Transcontinental, Showing All Trails

These maps were prepared for us by the Automobile Blue Book Company.

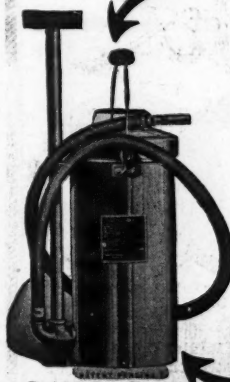
Copies may be obtained from any dealer displaying the sign with the orange disc, or mailed on request.

There is More Power in
THAT GOOD GULF GASOLINE and
SUPREME AUTO OIL

GULF REFINING COMPANY

Dept. 1875 Frick Annex

PITTSBURGH, PA.



Stores, Measures and Pumps Your Grease

Keep your transmission greases in a clean place, and deliver them to the parts of your car as needed, simply operate the pump.

Runyen's Grease Cabinet—\$7

—is a convenient container and pump. Operates six times as fast as you can work by hand. Eliminates waste. Made in four sizes. Write for free circular.

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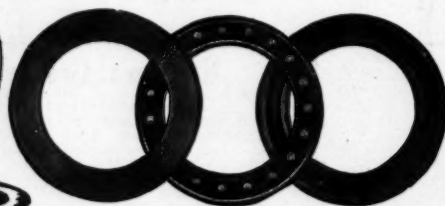
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Sales Department, 250 W. 54th St., New York

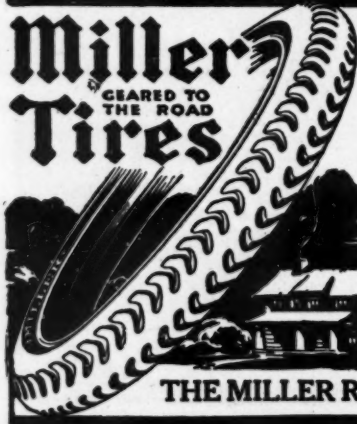


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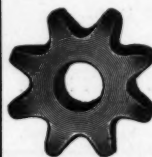
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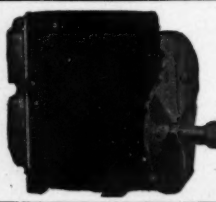
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An unusual opportunity awaits the right man. State your experience when writing to Box E 408, care of MOTOR AGE, Chicago, Ill.

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Each75

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2,000,000 Auto Parts in Stock

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Saves jolts, jars and vibrations and furnishes the very object of motoring—Comfort.

Adds longer life to all parts of your car by preventing sudden expansion and contraction of springs.

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30 H. P. Unit Power Plants..... \$170.00

Engines only..... 125.00

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All Four Cylinder Four Cycle

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Pittsburgh, Pa., and Peru, Ind.

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Franklin, 4 cyl., 4 x 4½..... \$ 40.00

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Above are used motors, guaranteed to be in good shape. Will take other motors in on trade.

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Krit 1915 Unit Power Plant with pump, carburetor, Remy unispartaker, levers, pedals, plugs, fan, etc.	175.00
Krit 1914 unit power plant with Remy unispartaker, carburetor, fan, pedals and pump.	160.00
Serviss 2½x3½" (motor only).	80.00
DeLuxe 2-cyl., 9 H. P. (cyclecar).	50.00

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Reliance 50-60 H. P., fitted with 18 feed oiler, timer, plugs and priming caps.	85.00
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Brown & Lippe three-speed with levers.	50.00
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Weston-Mott full floating (complete)	85.00
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Size	Plain	Non Skid	Stitched	Size	Plain	Non Skid	Stitched
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30x3½.....	4.80	6.80		34x4.....	7.20	9.00	

For Particulars Write

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We reserve the right to reject any work because of condition

By Condition											
If you Furnish Both			If we Furnish One		If you Furnish Both			If we Furnish One			
SIZE	Casings	Casing	SIZE	Casings	Casing	SIZE	Casings	Casing	SIZE	Casings	Casing
30x3.....	\$2.75	\$4.00	36x4.....	\$4.50	\$6.50	30x3.....	\$2.75	\$4.00	36x4.....	\$4.50	\$6.50
32x3.....	2.75	4.00	38x4.....	4.75	6.75	32x3.....	2.75	4.00	38x4.....	4.75	6.75
30x3½.....	3.00	4.50	34x4½.....	4.50	6.50	30x3½.....	3.00	4.50	34x4½.....	4.50	6.50
31x3½.....	3.00	4.50	35x4½.....	4.75	7.25	31x3½.....	3.00	4.50	35x4½.....	4.75	7.25
32x3½.....	3.00	4.50	36x4½.....	4.75	7.25	32x3½.....	3.00	4.50	36x4½.....	4.75	7.25
34x3½.....	3.25	4.75	37x4½.....	5.00	7.50	34x3½.....	3.25	4.75	37x4½.....	5.00	7.50
36x3½.....	3.50	5.00	38x4½.....	5.25	8.00	36x3½.....	3.50	5.00	38x4½.....	5.25	8.00
30x4.....	3.50	5.00	40x4½.....	5.50	8.75	30x4.....	3.50	5.00	40x4½.....	5.50	8.75
31x4.....	3.75	5.25	42x4½.....	5.50	10.00	31x4.....	3.75	5.25	42x4½.....	5.50	10.00
32x4.....	3.75	5.25	35x5.....	5.00	7.50	32x4.....	3.75	5.25	35x5.....	5.00	7.50
33x4.....	4.00	5.50	36x5.....	5.50	8.50	33x4.....	4.00	5.50	36x5.....	5.50	8.50
34x4.....	4.25	6.00	37x5.....	5.50	9.00	34x4.....	4.25	6.00	37x5.....	5.50	9.00
35x4.....	4.25	6.00				35x4.....	4.25	6.00			

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30x3½.....	6.50 2.15	36x4.....	10.00 3.35
31x3½.....	7.25 2.20	34x4½.....	12.00 4.00
32x3½.....	7.50 2.25	35x4½.....	12.50 4.10
34x3½.....	8.00 2.35	36x4½.....	13.50 4.15
30x4.....	8.50 2.85	37x4½.....	14.00 4.25
31x4.....	8.75 2.95	36x5.....	15.00 4.95
32x4.....	8.50 3.05	37x5.....	16.00 5.05
33x4.....	9.00 3.10		

Non-Skids \$1.00 Extra; All Sizes

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10% required on C. O. D. orders

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We lead all competitors in prices on slightly used and demonstrating tires

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30x3½.....	3.50	33x4.....	6.25	35x4.....	7.50
30x4.....	4.25	34x4½.....	7.00	36x4½.....	7.25
32x3½.....	4.50	36x3½.....	6.75	37x4½.....	8.25
31x4.....	4.25	34x4.....	6.75	36x5.....	8.25
32x4.....	6.00	32x4½.....	6.00	37x5.....	8.50

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AUTO SALES AND PARTS

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on your next

TIRE BILL

by using our

DOUBLE TREAD TIRES

Size	Plain	Size	Plain
30x3.....	\$4.00	34x4.....	\$ 8.00
30x3½.....	5.00	36x4.....	8.00
32x3½.....	6.00	34x4½.....	9.00
34x3½.....	7.00	35x4½.....	9.00
32x4.....	7.00	36x5.....	11.00
33x4.....	7.00	37x5.....	11.00

NON-SKIDS \$1.00 EXTRA

For retreading your old tires we charge you 40% off above prices. Make sure when ordering tires to state whether Q. D. straight bead or clincher type.

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I. JAFFESS

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SO-LUMINUM The Aluminum Solder

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\$4.50 brings an Auto Hot Plate to you by parcel post prepaid, packed in neat carton, 8x8x5. Weighs only 6 pounds.

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The Woodworth Trouble-Proof Tire is rendered puncture proof by incorporating in it



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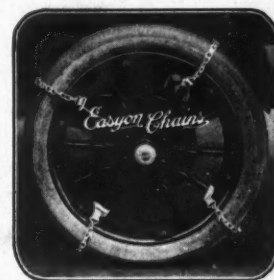
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The Easyon Tire Chains can be applied or removed in a moment even when stuck in the mud.

You do not need chains very often, but when you do, you want something you can put on easily that will pull you through the mud, snow or other slippery roads. The EASYON CHAINS are what you want.

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in a

Packard
"TWIN-SIX"

is distinguished by a superior comfort and security

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